STIC Search Report
EIC 1700

STIC Database Tracking Number: 174287

TO: Gregg Cantelmo
Location: REM 6B71
Art Unit : 1745
December 21, 2005

Case Serial Number: 10/620687

From: Ross Shipe
Location: EIC 1700
REMSEN 4B31
Phone: 571/272-6018
Ross.Shipe@uspto.gov

Search Notes

Examiner Cantelmo:

Please review the attached search results.
If you have any questions or if you would like to refine the search query, please feel free to contact me at any time.

Thanks you for using EIC 1700 search services!

Ross Shipe (ASRC)
Technical Information Specialist

Access DB# _____

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Greg Cantelmo Examiner # : _____ Date: _____
Art Unit: _____ Phone Number 30 _____ Serial Number: 10/620,682
Mail Box and Bldg/Room Location: _____ Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Lithium Rechargeable Battery

Inventors (please provide full names): _____

_____

Earliest Priority Filing Date: _____

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

****

STAFF USE ONLY	**Type of Search**		**Vendors and cost where applicable**
Searcher: RDS	NA Sequence (#)		STN ✓
Searcher Phone #:	AA Sequence (#)		Dialog
Searcher Location:	Structure (#)		Questel/Orbit
Date Searcher Picked Up:	Bibliographic	✓	Dr.Link
Date Completed: 12/21/05	Litigation		Lexis/Nexis
Searcher Prep & Review Time: 30	Fulltext		Sequence Systems
Clerical Prep Time:	Patent Family		WWW/Internet
Online Time: ~~30~~ 105	Other		Other (specify)

PTO-1590 (8-01)

Mellerson, Kendra 174287

From: "Gregg Cantelmo" [gregg.cantelmo]
Sent: Wednesday, December 14, 2005 4:05 PM
To: STIC-EIC1700
Subject: Database Search Request, Serial Number: 10/620687

Requester:
Gregg Cantelmo (TC1700)
Art Unit:
1745
Employee Number:
75777
Office Location:
REM 6B71
Phone_Number:
571-272-1283
Mailbox Number:

Case serial number:
10/620687
Class / Subclass(es):

Earliest Priority Filing Date:

Format preferred for results:
Paper
Search Topic Information:
Alleged novelty lies in the mixed graphite material of claim 1/
Special Instructions and Other Comments:

STIC Search Results Feedback Form

USPTO

EIC17000

Questions about the scope or the results of the search? Contact *the EIC searcher or contact*:

Kathleen Fuller, EIC 1700 Team Leader
571/272-2505 REMSEN 4B28

Voluntary Results Feedback Form

- *I am an examiner in Workgroup:* ☐ *Example: 1713*
- *Relevant prior art* ***found****, search results used as follows:*
  - ☐ 102 rejection
  - ☐ 103 rejection
  - ☐ Cited as being of interest.
  - ☐ Helped examiner better understand the invention.
  - ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
  (journal articles, conference proceedings, new product announcements etc.)

- *Relevant prior art* ***not found:***
  - ☐ Results verified the lack of relevant prior art (helped determine patentability).
  - ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

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=> d his full

     FILE 'REGISTRY' ENTERED AT 09:48:46 ON 21 DEC 2005
L1             1 SEA ABB=ON  PLU=ON  COPPER/CN
L2             1 SEA ABB=ON  PLU=ON  GRAPHITE/CN

     FILE 'HCAPLUS' ENTERED AT 09:49:13 ON 21 DEC 2005
L3       1169095 SEA ABB=ON  PLU=ON  COPPER OR CU OR L1
L4        715431 SEA ABB=ON  PLU=ON  ELECTRODE# OR CATHODE#
L5        191171 SEA ABB=ON  PLU=ON  GRAPHITE# OR BLACK (2A) LEAD OR
                 PLUMBAGO## OR L2
L6       2533705 SEA ABB=ON  PLU=ON  ARTIFICIAL? OR SYNTHETIC? OR
                 SIMULAT? OR FABRICAT? OR MANMADE OR MAN (A) MADE OR
                 ERSATZ OR SUBSTITUT?
L7        827599 SEA ABB=ON  PLU=ON  SPHERICAL? OR ROUND? OR CIRCULAR? OR
                 CURV? OR SPHERIOD##
L9             6 SEA ABB=ON  PLU=ON  L7 (2A) L5 AND L6 (2A) L5 AND L4
L12          133 SEA ABB=ON  PLU=ON  L7 (L) L5 AND L6 (L) L5 (L) L4
L13        18855 SEA ABB=ON  PLU=ON  MESOPHASE OR MESOPHASIC
L14        48953 SEA ABB=ON  PLU=ON  PITCH##
L16            2 SEA ABB=ON  PLU=ON  L13 AND L12
L19            6 SEA ABB=ON  PLU=ON  L13 AND L14 AND L4 AND L5 AND L3
L20           51 SEA ABB=ON  PLU=ON  L13 (L) L14 (L) L4 (L) L5
L21           24 SEA ABB=ON  PLU=ON  L13 (L) L14 (L) L4 (L) L5 AND
                 ELECTRO?/SC,SC
L22           27 SEA ABB=ON  PLU=ON  L20 NOT L21
L23           25 SEA ABB=ON  PLU=ON  L22 AND (57? OR 51?)/SC
L26           25 SEA ABB=ON  PLU=ON  L23 NOT (L9 OR L16 OR L19 OR L21)
L28           10 SEA ABB=ON  PLU=ON  L26 AND (ELECTRODE# OR CATHODE#)/TI
L29           43 SEA ABB=ON  PLU=ON  L9 OR L16 OR L19 OR L21 OR L28

     FILE 'WPIX' ENTERED AT 11:08:57 ON 21 DEC 2005
L30            9 SEA ABB=ON  PLU=ON  L9 OR L16 OR L19 OR L21 OR L28

     FILE 'INSPEC' ENTERED AT 11:11:39 ON 21 DEC 2005
L31            4 SEA ABB=ON  PLU=ON  L9 OR L16 OR L19 OR L21 OR L28

     FILE 'JICST-EPLUS' ENTERED AT 11:16:02 ON 21 DEC 2005
L32            0 SEA ABB=ON  PLU=ON  L9 OR L16 OR L19 OR L21 OR L28

     FILE 'JAPIO' ENTERED AT 11:16:31 ON 21 DEC 2005
L33            6 SEA ABB=ON  PLU=ON  L9 OR L16 OR L19 OR L21 OR L28

     FILE 'COMPENDEX' ENTERED AT 11:17:21 ON 21 DEC 2005
L34            3 SEA ABB=ON  PLU=ON  L9 OR L16 OR L19 OR L21 OR L28


=> file wpix
FILE 'WPIX' ENTERED AT 11:21:03 ON 21 DEC 2005
COPYRIGHT (C) 2005 THE THOMSON CORPORATION


=> d que l30
L1             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  COPPER/CN
L2             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  GRAPHITE/CN
L3       1169095 SEA FILE=HCAPLUS ABB=ON  PLU=ON  COPPER OR CU OR L1
L4        715431 SEA FILE=HCAPLUS ABB=ON  PLU=ON  ELECTRODE# OR CATHODE#
L5        191171 SEA FILE=HCAPLUS ABB=ON  PLU=ON  GRAPHITE# OR BLACK (2A)
                 LEAD OR PLUMBAGO## OR L2
L6       2533705 SEA FILE=HCAPLUS ABB=ON  PLU=ON  ARTIFICIAL? OR SYNTHETIC
                 ? OR SIMULAT? OR FABRICAT? OR MANMADE OR MAN (A) MADE OR
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                ERSATZ OR SUBSTITUT?
L7         827599 SEA FILE=HCAPLUS ABB=ON  PLU=ON  SPHERICAL? OR ROUND? OR
                CIRCULAR? OR CURV? OR SPHERIOD##
L9              6 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L7 (2A) L5 AND L6 (2A)
                L5 AND L4
L12           133 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L7 (L) L5 AND L6 (L) L5
                (L) L4
L13         18855 SEA FILE=HCAPLUS ABB=ON  PLU=ON  MESOPHASE OR MESOPHASIC

L14         48953 SEA FILE=HCAPLUS ABB=ON  PLU=ON  PITCH##
L16             2 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 AND L12
L19             6 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 AND L14 AND L4 AND
                L5 AND L3
L20            51 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 (L) L14 (L) L4 (L)
                L5
L21            24 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 (L) L14 (L) L4 (L)
                L5 AND ELECTRO?/SC,SC
L22            27 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L20 NOT L21
L23            25 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L22 AND (57? OR 51?)/SC

L26            25 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L23 NOT (L9 OR L16 OR
                L19 OR L21)
L28            10 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L26 AND (ELECTRODE# OR
                CATHODE#)/TI
L30             9 SEA FILE=WPIX ABB=ON  PLU=ON  L9 OR L16 OR L19 OR L21 OR
                L28


=> d l30 full 1-9

L30  ANSWER 1 OF 9  WPIX  COPYRIGHT 2005 THE THOMSON CORP on STN
AN   2005-435450 [44]    WPIX
DNN  N2005-353359        DNC C2005-133644
TI   Production of carbon negative electrode materials for
     lithium-ion batteries, for applications in electrical and electronic
     industries particularly for e.g. mobile phones, portable computers
     and digital cameras.
DC   E36 L03 X16
IN   HE, Z; MA, J; WANG, J; DING, X; FENG, S; FU, Z; LI, S; ZHANG, D
PA   (SHAN-N) SHANGHAI SHANSHAN SCI & TECHNOLOGY CO LTD; (SHAN-N)
     SHANGHAI SHANSHAN TECH CO LTD
CYC  108
PI   WO 2005055346   A1 20050616 (200544)* ZH   13     H01M004-58
        RW: AT BE BG BW CH CY CZ DE DK EA EE ES FI FR GB GH GM GR HU IE
            IS IT KE LS LU MC MW MZ NA NL OA PL PT RO SD SE SI SK SL SZ
            TR TZ UG ZM ZW
         W: AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU
            CZ DE DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN
            IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW
            MX MZ NA NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL SY
            TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
     CN 1624955      A  20050608 (200566)             H01M004-04
ADT  WO 2005055346 A1 WO 2004-CN1297 20041115; CN 1624955 A CN
     2003-1108982 20031201
PRAI CN 2003-1108982      20031201
IC   ICM  H01M004-04; H01M004-58
     ICS  C01B031-00
AB   WO2005055346 A UPAB: 20050712
     NOVELTY - A process for producing carbon negative electrode
     materials for lithium-ion batteries comprises supplying a coating
     material of natural graphite and a coating material of heavy
     material of natural graphite and a coating material of heavy
     aromatic hydrocarbon or its mixture, polymerization to give a
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coating layer with microcapsulation on surface of the natural graphite, extraction and separation then drying to a dried product for carbonizing or graphitizing.

DETAILED DESCRIPTION - A process for producing carbon negative **electrode** materials for lithium-ion batteries comprises:

(1) supplying a coating material (A) of natural graphite and a coating material (B) of heavy aromatic hydrocarbon or its mixture, in a weight ratio of (A):(B) = 1:0.5-10;

(2) polymerization of the resultant solid-liquid mixture at 350-500 deg. C, at a pressure of 0.01-10 MPa for 5-450 minutes to give a coating layer with microcapsulation on surface of the natural graphite;

(3) extraction and separation of solid-phase granules in the reaction system;

(4) drying to remove the light component in such solid-phase granules to a dried product that has a weight gain of 2-100%, with respect to graphite raw material; and

(5) carbonizing or graphitizing the product to obtain a carbon negative **electrode** material that has a surface-coated layer of artificial carbon or **artificial graphite** at 80-220 deg. C or 2400-3000 deg. C, respectively.

USE - The thus produced batteries are applications in electrical and electronic industries particularly for e.g. mobile phones, portable computers and digital cameras.

ADVANTAGE - Such lithium-ion batteries thus made have high specific capacity and long cycle lifetime.

Dwg.0/0

TECH WO 2005055346 A1UPTX: 20050712

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Materials: The natural **graphite** is particularly **spherical** or plate-like natural graphite.

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Materials: The heavy aromatic hydrocarbon or its mixture is selected from tar coal, coal pitch, petroleum pitch and their mixture. The method for separation is by applying a solvent, centrifugation or precipitation. Such method with solvent for separation can employ a solvent chosen from anthracene oil, washing oil, diesel oil, pyridine, quinoline, xylene and toluene, in a weight ratio of such solvent to the reaction product of 0.5-5:1. During drying, the temperature is set at 200-500degreesC. When graphitizing, the graphitization temperature is particularly at 2800- 300degreesC.

ABEX WO 2005055346 A1UPTX: 20050712

EXAMPLE - Spherical natural graphite and tar coal (1:1 in ratio) were reacted at 400degreesC and 0.1 MPa for 60 minutes. After work-up, the resulting product was carbonized at 1000degreesC. Properties of the thus obtained electrode material: D50 = 20.1 microns; weight gain = 6.2%; true density = 2.18 g/cm3; vibration-packed density = 1.25 g/cm3; specific area = 2.6 m2/g; initial discharge capacity = 335 mAh/g; and initial discharge efficiency = 94.3%.

FS CPI EPI

FA AB; DCN

MC CPI: E31-N04B; L03-E01B5

EPI: X16-E01C; X16-E03A; X16-E08

L30 ANSWER 2 OF 9 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2004-273975 [26] WPIX

DNN N2004-216708 DNC C2004-107064

TI Activated carbon, useful for electrical double layer capacitor, has preset specific surface area and pore volume.

DC E36 L03 V01 X16 X21

PA (HOND) HONDA MOTOR CO LTD; (KASH-N) KASHIMA SEKIYU KK; (KURS) KURARAY CHEM CO LTD
CYC 1
PI JP 2004067498 A 20040304 (200426)* 18 C01B031-12
ADT JP 2004067498 A JP 2003-150869 20030528
PRAI JP 2002-173146 20020613
IC ICM C01B031-12
ICS H01G009-058
AB JP2004067498 A UPAB: 20040421
NOVELTY - Activated carbon has Brunauer Emmett Teller (BET) specific surface area of less than 1200 m2/g by nitrogen absorption process, and pore volume of 0.3 ml/g or more, measured with t-plotting method by nitrogen adsorption.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:
(1) manufacture of activated carbon; and
(2) electrical double layer capacitor (1).
USE - For electrical double layer capacitor (claimed).
ADVANTAGE - The activated carbon is recyclable for a long period of time, and provides an electrical double layer capacitor having high volume capacitance and durability.
DESCRIPTION OF DRAWING(S) - The figure shows a typical perspective view of the electrical double layer capacitor.
electrical double layer capacitor 1
pressure plates 3, 4
electrodes 5, 6
aluminum meshes 7, 8
aluminum wires 9, 10
Dwg.1/4
TECH JP 2004067498 AUPTX: 20040421
TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Properties: The BET specific surface area is 700-900 m2/g and the pore volume is 0.3-0.4 ml/g. The molding density of activated carbon by electrolyzing process is 0.80-0.95 g/cm3, and the electrical double layer capacitor has capacitance of more than 30 F/cm3.
Preferred Composition: The activated carbon contains 4 wt.% or less of oxygen, and at least one type of functional group with respect to surface functional groups containing 0.5 meq/g or less of carboxyl, quinone, hydroxyl and lactone groups by hydrochloric acid titrimetric method. The activated carbon may further comprise 20 ppm or less of nickel, 5 ppm or less of iron, 1 ppm of less of **copper** and silver, and 200 ppm or less of transition metal (compound).
Preferred Carbon: The activated carbon is obtained by alkali activation processing a carbon material having **graphite** property.
Preferred Precursor: The carbon precursor is a synthetic **mesophase pitch.**
FS CPI EPI
FA AB; GI; DCN
MC CPI: E11-Q01; E11-Q02; E31-H03; E31-N03; E31-N04C; L03-B03A
EPI: V01-B01A; V01-B01D; X16-L02; X21-B04

Applicant

L30 ANSWER 3 OF 9 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
AN 2004-156212 [15] WPIX
DNN N2004-125079 DNC C2004-061955
TI Lithium rechargeable battery for use as driving power source, includes negative **electrode** having active mixture layer of **artificial** and **spherical graphite** particles fixed on **copper** core material.
DC A85 L03 X16
IN FUJIWARA, S; FUKUMOTO, Y; KATO, F; OURA, T; YAMAMOTO, N

PA (MATU) MATSUSHITA DENKI SANGYO KK; (MATU) MATSUSHITA ELECTRIC IND CO LTD
CYC 4
PI US 2004023115 A1 20040205 (200415)* 8 H01M004-58
JP 2004127913 A 20040422 (200428) 29 H01M004-02
CN 1481041 A 20040310 (200437) H01M004-58
KR 2004012541 A 20040211 (200438) H01M004-60
ADT US 2004023115 A1 US 2003-620687 20030717; JP 2004127913 A JP 2003-160969 20030605; CN 1481041 A CN 2003-152250 20030730; KR 2004012541 A KR 2003-52624 20030730
PRAI JP 2002-223862 20020731
IC ICM H01M004-02; H01M004-58; H01M004-60
ICS H01M002-02; H01M004-62; H01M004-66; H01M010-36; H01M010-40
AB US2004023115 A UPAB: 20040302
NOVELTY - A lithium rechargeable battery comprises positive and negative **electrodes**, and a non-aqueous electrolyte. The negative **electrode** comprises a **copper** core material and a negative **electrode** material mixture layer fixed on the core material. The negative **electrode** material mixture layer includes an active material having a mixture of **artificial graphite** particles and **spherical graphite** particles.
DETAILED DESCRIPTION - A lithium rechargeable battery comprises positive and negative **electrodes** (2, 3), and a non-aqueous electrolyte. The negative **electrode** comprises a **copper** core material and a negative **electrode** material mixture layer fixed on the core material. The negative **electrode** material mixture layer includes an active material having a mixture of **artificial** and **spherical** **graphite** particles. The **artificial** **graphite** particles are isotropic **artificial** **graphite** particles with **graphite** structure oriented at random. They have not more than 3.362 Angstrom inter planar spacing d002 between the (002) planes; not more than 1000 I002/I110 ratio of the peak intensity (I002) attributed to the (002) plane to the peak intensity (I110) attributed to the (110) plane, which are found from a diffraction pattern of the **artificial** **graphite** particles A molded into a pellet of 1.6 g/cm3 in density; 0.85-0.95 mean **circularity** of the particles; 15-30 mu m particle diameter (D50) corresponding to a volume fraction of 50% and 0.2-0.5 D10/D90 ratio of a particle diameter (D10) corresponding to a volume fraction of 10% to a particle diameter (D90 corresponding to a volume fraction of 90%; not less than 1 g/cm3 tap density after tapping of 900 times with a stroke length of 18 mm; and not more than m2/g specific surface area. The **spherical graphite** particles B have a mean **circularity** of the particles of 0.88-1; D50 corresponding to a volume fraction of 50% of 5-15 mu m; d002 between the (002) planes of not more than 3.357 Angstrom ; and not more than 8 m2/g specific surface area.
USE - As driving power source.
ADVANTAGE - The inventive battery is a portable, wireless, compact and lightweight battery having high energy density.
DESCRIPTION OF DRAWING(S) - The figure is an oblique view illustrating a lithium rechargeable battery.
Electrode group 1
Positive and negative **electrodes** 2, 3
Case 4
Sealing plate 5
Dwg.1/1
TECH US 2004023115 A1UPTX: 20040302
TECHNOLOGY FOCUS - CERAMICS AND GLASS - Preferred Material: The

artificial graphite particles A are obtained by kneading and granulating a base material of pulverized bulk **mesophase pitch** with **pitch** in a softened state and/or thermosetting resin, carbonizing the resulting granules at 700-1500degreesC, and graphitizing the carbonized granules at 2500-3000degreesC. The **spherical graphite** particles B are natural **graphite** particles and/or natural **graphite** particles partially subjected to reforming treatment to obtain amorphous surfaces. Preferred Composition: The **spherical graphite** particles B are present at 5-45 wt.%. Preferred Property: The negative **electrode** material mixture layer has a density of 1.6-1.8 g/cm3 and a thickness of 40-100 mum.
TECHNOLOGY FOCUS - ELECTRICAL POWER AND ENERGY - Preferred Component: The positive and negative **electrodes** with a separator are wound to form an **electrode** group (1). The **electrode** group is accommodated and sealed in a prismatic metal case (4) or a case made of aluminum foil laminate and a resin film.

TECHNOLOGY FOCUS - POLYMERS - Preferred Component: The negative **electrode** material mixture layer further includes a rubber-like binder containing a butadiene unit and a cellulose-based thickener. Preferred Composition: The rubber-like binder is added at not more than3 pbw with respect to 100 pbw active material.

FS CPI EPI
FA AB; GI
MC CPI: A12-E06A; A12-E06C; L03-E01B3
EPI: X16-E01C; X16-E08A

L30 ANSWER 4 OF 9 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
AN 2002-734690 [80] WPIX
DNN N2002-579196 DNC C2002-208090
TI Lead-acid battery for electric cars and elevators, comprises anode which is added with carbon and simple substance and/or compound having catalyst for desulfurization or oxidation of sulfur oxides.
DC E36 J04 L03 X16
IN HONBO, K; HOSHI, E; MURANAKA, Y; TAKEUCHI, S
PA (HITA) HITACHI LTD; (KOBE) SHIN KOBE ELECTRIC MACHINERY; (HONB-I) HONBO K; (HOSH-I) HOSHI E; (MURA-I) MURANAKA Y; (TAKE-I) TAKEUCHI S
CYC 28
PI EP 1248307 A1 20021009 (200280)* EN 31 H01M004-14
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR
JP 2002367613 A 20021220 (200313) 15 H01M004-62
US 2003049528 A1 20030313 (200321) H01M004-62
US 2004180264 A1 20040916 (200461) H01M004-62
ADT EP 1248307 A1 EP 2002-5531 20020311; JP 2002367613 A JP 2002-67800 20020313; US 2004180264 A1 US 2002-96505 20020313; US 2003049528 A1 US 2002-96505 20020313; US 2004180264 A1 Cont of US 2002-96505 20020313, US 2004-812005 20040330
PRAI JP 2001-104080 20010403
IC ICM H01M004-14; H01M004-62
ICS B01J021-18; B01J023-00; H01M004-38
AB EP 1248307 A UPAB: 20021212
NOVELTY - The lead-acid battery comprises an anode, a **cathode** and an electrolytic solution. The anode is added with carbon, and a simple substance and/or compound having a catalyst for desulfurization or oxidation of sulfur oxides.
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for the carbon material used in lead-acid batteries.
USE - For electrical cars, simple hybrid cars, power storage systems, elevators, electric tools, uninterruptable power sources

and distributed power sources.
ADVANTAGE - The lead-acid battery is superior in high-efficiency charging characteristics, due to the addition of carbon and simple substance and/or compound having a catalyst, to the anode. The conductivity of lead sulfate, and the solubility of lead sulfate into the lead ion are improved, hence the charging reaction of anode active material proceeds smoothly. The carbon materal used in anode has superior charge acceptability. The battery exhibits a small energy loss due to the gas generated during large-current charging. The current value necessary to discharge the total discharge capacity of the battery in 0.5 hour and 1 hour, are 2C and 1C, respectively. The carbon can be adsorbed on the reaction interface of the active material of the lead-acid battery, thereby the passivation of lead sulfate which is called sulfation can be suppressed, no passivation proceeds even when complete discharge has been made and charge acceptability is remarkably improved.
DESCRIPTION OF DRAWING(S) - The figure shows the model of the catalyst used for desulfurization.
Dwg.6/8

TECH EP 1248307 A1 UPTX: 20021212
TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Catalyst: The catalyst, is catalyst used for petroleum refining, fuel oil desulfurization, gas production or pollution control.
Preferred Substance: The simple substance is an oxide, sulfate, hydroxide and/or carbide of hafnium, niobium, tantalum, tungsten, silver, zinc, nickel, **copper**, molybdenum, **copper**, vanadium, manganese, barium, potassium, cesium, rubidium, strontium and sodium. The carbon is carbon black, acetylene black, natural **graphite**, artificial **graphite**, pyrolytic carbon, coke, isotropic **graphite**, **mesophase** carbon, **pitch**-based carbon fiber, carbon fiber by vapor phase growth, carbon fluoride, nanocarbon, active carbon, active carbon fiber or polyacrylonitrile-based fiber.

FS CPI EPI
FA AB; GI; DCN
MC CPI: E11-Q02; E31-F01A; E31-N04; E31-N05A; E33; E34; E35; J04-E04; L03-E01B; L03-E01B1; N06
EPI: X16-E04

L30 ANSWER 5 OF 9 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
AN 2002-398958 [43] WPIX
DNN N2002-312950 DNC C2002-112497
TI Carbon film manufacture for **electrodes** of non-aqueous electrolyte secondary battery, involves dispersing carbon material in aprotic solvent in which electroconductive substrate and counter **electrode** are soaked.
DC L03 X12 X16
PA (KOUR-I) KOURA N; (SHAF) SHARP KK
CYC 1
PI JP 2002063894 A 20020228 (200243)* 16 H01M004-04
ADT JP 2002063894 A JP 2000-251100 20000822
PRAI JP 2000-251100 20000822
IC ICM H01M004-04
ICS C25B007-00; H01B001-04; H01M004-02; H01M004-58; H01M004-66; H01M010-40
AB JP2002063894 A UPAB: 20020709
NOVELTY - A carbon material (2) is dispersed in an aprotic solvent (1) in which iodine is dissolved. An electroconductive substrate and a counter **electrode** are soaked in the solvent as **cathode** (31) and anode (32), respectively. A carbon film is made to deposit on the surface of electroconductive substrate by electrophoresis electrodeposition, when a direct flow electric field

is impressed between the **electrodes**.
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for non-aqueous electrolyte secondary battery.
USE - For **electrodes** of non-aqueous electrolyte secondary battery (claimed).
ADVANTAGE - The carbon film is directly deposited on the substrate by simple method. The carbon film has reduced weight and high industrial utility. The active material density of **electrode** formed from carbon film is increased.
DESCRIPTION OF DRAWING(S) - The figure shows outline view of manufacture of carbon film.
Aprotic solvent 1
Carbon material 2
Cathode 31
Anode 32
Dwg.1/8

TECH JP 2002063894 AUPTX: 20020709
TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Compounds: The aprotic solvent is acetone or acetyl acetone. The carbon material is chosen from artificial **graphite**, natural **graphite**, high crystalline **graphite**, **mesophase pitch**, isotropic **pitch**, mesocarbon micro beads and coke. The electroconductive substrate comprises **copper**, nickel, stainless steel, brass, molybdenum and tungsten.

FS CPI EPI
FA AB; GI
MC CPI: L03-E01B9
EPI: X12-D01C; X16-B01F; X16-E01; X16-E01C; X16-E01G; X16-E02

L30 ANSWER 6 OF 9 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
AN 2000-507805 [46] WPIX
DNN N2000-375557 DNC C2000-152320
TI Negative **electrode** for non-aqueous electrolyte secondary battery, has carbon material with aggregated **graphite** powder and **mesophase pitch** type **graphite** fibers.
DC A14 A85 L03 X16
PA (KOBE) SHIN KOBE ELECTRIC MACHINERY
CYC 1
PI JP 2000156226 A 20000606 (200046)* 5 H01M004-58
ADT JP 2000156226 A JP 1998-327923 19981118
PRAI JP 1998-327923 19981118
IC ICM H01M004-58
ICS H01M004-02; H01M004-62; H01M010-40
AB JP2000156226 A UPAB: 20000921
NOVELTY - The **electrode** consists of a rolled **copper** foil on which a mixture of carbon material and polyvinylidene fluoride resin binder is adhered. The carbon material consists of aggregated **graphite** powder and **mesophase pitch** type **graphite** fiber material.
USE - For non-aqueous secondary battery e.g. nickel-cadmium battery, lead battery, nickel hydrogen battery used in portable telephone, notebook personal computer.
ADVANTAGE - The mixture density and mixture adhesion are raised by the usage of aggregated **graphite** powder and **mesophase graphite** powder, thus irreversible capacitance and the gas evolution at high temperature is suppressed. The peeling and the crack of a mixture layer is prevented, thus excellent cycle property is obtained.
Dwg.0/0
FS CPI EPI

FA AB
MC CPI: A04-E10B; A12-E06; L03-E01B3
EPI: X16-B01F; X16-E01C; X16-E09

L30 ANSWER 7 OF 9 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
AN 1989-238387 [33] WPIX
DNN N1989-181475 DNC C1989-106466
TI Electrochemical detector for high speed liq. chromatography - has cell with working **electrode** composed of synthetic polymer cpd. and graphite, counter-**electrode**, reference **electrode**, etc..
DC A89 B04 J04 S03
PA (ACOM-N) ACOM KK; (SEKI) SEKISUI CHEM IND CO LTD
CYC 1
PI JP 01173861 A 19890710 (198933)* 7
ADT JP 01173861 A JP 1987-335803 19871228
PRAI JP 1987-335803 19871228
IC G01N027-46; G01N030-64
AB JP 01173861 A UPAB: 19930923
An electrochemical detector for high speed liq chromatography having a cell with a working **electrode**, a counter **electrode** and a reference **electrode**, and detection part is claimed where the working **electrode** is constructed of a compn mainly consisting of a synthesised polymer cpd and **spherical graphite** carbon.
In the compn, the amnt of the **spherical graphite** carbon is pref 20 - 80 wt %. The synthesised polymer cpd is not specially limited, but it must be a material which is not dissolved or swelled with the eluate of the liq chromatography. For example, fluorine resin, polyphenylene sulphide resin etc are pref.
USE/ADVANTAGE - An electrochemical detector which enables the measurement of high sensitivity is obtd. It is esp useful for measuring vitamins, steroids, and various chemicals in a sample which is sepd by high speed liq chromatography.
0/0
FS CPI EPI
FA AB; DCN
MC CPI: A12-E14; A12-L04; A12-V03C2; B03-L; B04-B02D; B04-C03; B05-C06; B11-C08B; B11-C08D2; B12-K04; J04-B01C
EPI: S03-E03; S03-E03C; S03-E09C5

L30 ANSWER 8 OF 9 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
AN 1989-123644 [17] WPIX
DNN N1989-094269 DNC C1989-054780
TI Exothermic conductive coating compsns. - contg. spherical carbon particles, and synthetic resin, used in heating units with uniform temp. distribution up to 450 deg. C.
DC A28 A32 G02 L03 P73 X25 X27
IN OTA, T
PA (ASKH-N) ASK HEATING KK; (OTAT-I) OTA T; (ASKH-N) ASK HEATING CO LTD; (OHOT-I) OHOTA T
CYC 12
PI EP 312688 A 19890426 (198917)* EN 17
R: CH DE FR GB LI NL SE
JP 01107488 A 19890425 (198922)
JP 01108276 A 19890425 (198923)
NO 8802116 A 19890516 (198925)
EP 312688 B1 19930107 (199302) EN 18 C09D005-24
R: CH DE FR GB LI NL SE
DE 3877314 G 19930218 (199308) C09D005-24
CA 1323717 C 19931026 (199349) C09D005-24

NO 173878	B	19931108 (199350)		C09D005-24
JP 06089270	B2	19941109 (199443)	7	C09D005-24
KR 9401521	B1	19940223 (199503)		C09D005-24
US 5407741	A	19950418 (199521)	14	B32B005-16

ADT EP 312688 A EP 1988-107673 19880513; JP 01107488 A JP 1987-263955 19871021; JP 01108276 A JP 1987-263954 19871021; EP 312688 B1 EP 1988-107673 19880513; DE 3877314 G DE 1988-3877314 19880513, EP 1988-107673 19880513; CA 1323717 C CA 1988-566767 19880513; NO 173878 B NO 1988-2116 19880513; JP 06089270 B2 JP 1987-263954 19871021; KR 9401521 B1 KR 1988-5615 19880513; US 5407741 A Cont of US 1988-192143 19880510, Cont of US 1991-663086 19910228, US 1993-13177 19930129

FDT DE 3877314 G Based on EP 312688; NO 173878 B Previous Publ. NO 8802116; JP 06089270 B2 Based on JP 01108276

PRAI JP 1987-263955 19871021; JP 1987-263954 19871021

REP 4.Jnl.Ref; A3...199101; JP 52115445; JP 60008377; JP 61235471; No-SR.Pub; US 4035265

IC ICM B32B005-16; C09D005-24
ICS C09D005-00; H01B001-24; H05B003-14

AB EP 312688 A UPAB: 20010910
An exothermic conductive coating compsn comprises (i) carbon particles which mainly (pref at least 60 wt%) consist of spherical particles of dia not more than 500 microns; and (ii) a synthetic resin, pref a polyester resin, epoxy resin, polyamide, polyimide, polyethylene, F-contg polymer, polyetheretherketone, poly-phenylene sulphide, silicone resin or poly-titanocarbosilane resin and pref as 25-220 pts wt per 100 pts wt of (a).

Pref particles (i) have been heat treated at least 1500 deg.C and have an interplanar spacing in the crystalline structure of 3.425-3.358 Angstroms.

USE - Also claimed are conductive heating units which comprise a film of (i) plus (ii) on a shaped solid surface having **electrode** terminals mounted on it; in a claimed variant there may be further laminated exothermic layers, each of which has **electrode** terminals. The heating units can be used in interior walls, flooring, roofing, furnace inner surfaces, pipe surfaces, carpets, blankets etc.

ADVANTAGE - The compsns show uniform temp distribution and can produce arbitrarily adjustable temps up to 450 deg.C. Heating units can be prepd from complex-shaped substrates (e.g. with holes or surface unevenness) without localised over heating (cf use of needle-like, flake or fibrous carbon particles which does cause overheating).

Dwg.12/12

FS CPI EPI GMPI
FA AB; GI
MC CPI: A12-B01; A12-E10; G02-A05; G02-A05B; L03-A02E; L03-H04A
EPI: X25-B01B; X27-E01A3; X27-E02

L30 ANSWER 9 OF 9 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
AN 1975-H6109W [30] WPIX
TI Electric or solar energy heat store - has graphite and coal storage medium contained under vacuum in reflector-walled vessel.
DC Q55
PA (SCHM-I) SCHMID A W
CYC 1
PI DE 2401859 A 19750717 (197530)*
PRAI DE 1974-2401859 19740116
IC F03G007-02
AB DE 2401859 A UPAB: 19930831
The store has a central graphite **electrode** surrounded by the storage medium in the form of **spherical** elements of

graphite or **synthetic** coal. The medium is contained in a graphite container surrounded by heat reflectors made of relatively thin graphite cylinders. The assembly is contained in an evacuated steel cylinder which also encloses a heat exchanger through which heat can be withdrawn from the store. In a modification the sun is used as a heat source, the rays being entered into the store through mirrors. The use of graphite or coal as the storage medium allows storage temperatures up to 3273 deg. K.
FS GMPI
FA AB

=> file hcaplus
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FILE COVERS 1907 - 21 Dec 2005 VOL 143 ISS 26
FILE LAST UPDATED: 20 Dec 2005 (20051220/ED)

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This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d que l29

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L2	1	SEA FILE=REGISTRY ABB=ON PLU=ON GRAPHITE/CN
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L4	715431	SEA FILE=HCAPLUS ABB=ON PLU=ON ELECTRODE# OR CATHODE#
L5	191171	SEA FILE=HCAPLUS ABB=ON PLU=ON GRAPHITE# OR BLACK (2A) LEAD OR PLUMBAGO## OR L2
L6	2533705	SEA FILE=HCAPLUS ABB=ON PLU=ON ARTIFICIAL? OR SYNTHETIC ? OR SIMULAT? OR FABRICAT? OR MANMADE OR MAN (A) MADE OR ERSATZ OR SUBSTITUT?
L7	827599	SEA FILE=HCAPLUS ABB=ON PLU=ON SPHERICAL? OR ROUND? OR CIRCULAR? OR CURV? OR SPHERIOD##
L9	6	SEA FILE=HCAPLUS ABB=ON PLU=ON L7 (2A) L5 AND L6 (2A) L5 AND L4
L12	133	SEA FILE=HCAPLUS ABB=ON PLU=ON L7 (L) L5 AND L6 (L) L5 (L) L4
L13	18855	SEA FILE=HCAPLUS ABB=ON PLU=ON MESOPHASE OR MESOPHASIC
L14	48953	SEA FILE=HCAPLUS ABB=ON PLU=ON PITCH##
L16	2	SEA FILE=HCAPLUS ABB=ON PLU=ON L13 AND L12
L19	6	SEA FILE=HCAPLUS ABB=ON PLU=ON L13 AND L14 AND L4 AND L5 AND L3
L20	51	SEA FILE=HCAPLUS ABB=ON PLU=ON L13 (L) L14 (L) L4 (L) L5
L21	24	SEA FILE=HCAPLUS ABB=ON PLU=ON L13 (L) L14 (L) L4 (L)

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L22          27 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L20 NOT L21
L23          25 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L22 AND (57? OR 51?)/SC
L26          25 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L23 NOT (L9 OR L16 OR
                L19 OR L21)
L28          10 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L26 AND (ELECTRODE# OR
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L29          43 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L9 OR L16 OR L19 OR L21
                OR L28


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L5       191171 SEA FILE=HCAPLUS ABB=ON   PLU=ON  GRAPHITE# OR BLACK (2A)
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L6      2533705 SEA FILE=HCAPLUS ABB=ON   PLU=ON  ARTIFICIAL? OR SYNTHETIC
                ? OR SIMULAT? OR FABRICAT? OR MANMADE OR MAN (A) MADE OR
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L7       827599 SEA FILE=HCAPLUS ABB=ON   PLU=ON  SPHERICAL? OR ROUND? OR
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L9             6 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L7 (2A) L5 AND L6 (2A)
                L5 AND L4
L12          133 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L7 (L) L5 AND L6 (L) L5
                (L) L4
L13        18855 SEA FILE=HCAPLUS ABB=ON  PLU=ON  MESOPHASE OR MESOPHASIC

L14        48953 SEA FILE=HCAPLUS ABB=ON  PLU=ON  PITCH##
L16            2 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 AND L12
L19            6 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 AND L14 AND L4 AND
                L5 AND L3
L20           51 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 (L) L14 (L) L4 (L)
                L5
L21           24 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 (L) L14 (L) L4 (L)
                L5 AND ELECTRO?/SC,SC
L22           27 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L20 NOT L21
L23           25 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L22 AND (57? OR 51?)/SC
L26           25 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L23 NOT (L9 OR L16 OR
                L19 OR L21)
L28           10 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L26 AND (ELECTRODE# OR
                CATHODE#)/TI
L31            4 SEA FILE=INSPEC ABB=ON   PLU=ON  L9 OR L16 OR L19 OR L21
                OR L28


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=> d que l33
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L4     715431 SEA FILE=HCAPLUS ABB=ON   PLU=ON  ELECTRODE# OR CATHODE#
L5     191171 SEA FILE=HCAPLUS ABB=ON   PLU=ON  GRAPHITE# OR BLACK (2A)
              LEAD OR PLUMBAGO## OR L2
L6    2533705 SEA FILE=HCAPLUS ABB=ON   PLU=ON  ARTIFICIAL? OR SYNTHETIC
              ? OR SIMULAT? OR FABRICAT? OR MANMADE OR MAN (A) MADE OR
              ERSATZ OR SUBSTITUT?
L7     827599 SEA FILE=HCAPLUS ABB=ON   PLU=ON  SPHERICAL? OR ROUND? OR
              CIRCULAR? OR CURV? OR SPHERIOD##
L9           6 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L7 (2A) L5 AND L6 (2A)
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L12        133 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L7 (L) L5 AND L6 (L) L5
              (L) L4
L13      18855 SEA FILE=HCAPLUS ABB=ON  PLU=ON  MESOPHASE OR MESOPHASIC

L14      48953 SEA FILE=HCAPLUS ABB=ON  PLU=ON  PITCH##
L16          2 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 AND L12
L19          6 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 AND L14 AND L4 AND
              L5 AND L3
L20         51 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 (L) L14 (L) L4 (L)
              L5
L21         24 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 (L) L14 (L) L4 (L)
              L5 AND ELECTRO?/SC,SC
L22         27 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L20 NOT L21
L23         25 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L22 AND (57? OR 51?)/SC

L26         25 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L23 NOT (L9 OR L16 OR
              L19 OR L21)
L28         10 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L26 AND (ELECTRODE# OR
              CATHODE#)/TI
L33          6 SEA FILE=JAPIO ABB=ON  PLU=ON  L9 OR L16 OR L19 OR L21
              OR L28


=> file compendex
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L1          1 SEA FILE=REGISTRY ABB=ON  PLU=ON  COPPER/CN
L2          1 SEA FILE=REGISTRY ABB=ON  PLU=ON  GRAPHITE/CN
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L4     715431 SEA FILE=HCAPLUS ABB=ON   PLU=ON  ELECTRODE# OR CATHODE#
L5     191171 SEA FILE=HCAPLUS ABB=ON   PLU=ON  GRAPHITE# OR BLACK (2A)
              LEAD OR PLUMBAGO## OR L2
L6    2533705 SEA FILE=HCAPLUS ABB=ON   PLU=ON  ARTIFICIAL? OR SYNTHETIC
              ? OR SIMULAT? OR FABRICAT? OR MANMADE OR MAN (A) MADE OR
              ERSATZ OR SUBSTITUT?
L7     827599 SEA FILE=HCAPLUS ABB=ON   PLU=ON  SPHERICAL? OR ROUND? OR
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L9           6 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L7 (2A) L5 AND L6 (2A)
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L12        133 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L7 (L) L5 AND L6 (L) L5
              (L) L4
L13      18855 SEA FILE=HCAPLUS ABB=ON  PLU=ON  MESOPHASE OR MESOPHASIC
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L14       48953 SEA FILE=HCAPLUS ABB=ON  PLU=ON  PITCH##
L16           2 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 AND L12
L19           6 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 AND L14 AND L4 AND
                L5 AND L3
L20          51 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 (L) L14 (L) L4 (L)
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L21          24 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 (L) L14 (L) L4 (L)
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L22          27 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L20 NOT L21
L23          25 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L22 AND (57? OR 51?)/SC

L26          25 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L23 NOT (L9 OR L16 OR
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L28          10 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L26 AND (ELECTRODE# OR
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L34           3 SEA FILE=COMPENDEX ABB=ON  PLU=ON  L9 OR L16 OR L19 OR
                L21 OR L28


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=> d que l32
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L4       715431 SEA FILE=HCAPLUS ABB=ON  PLU=ON  ELECTRODE# OR CATHODE#
L5       191171 SEA FILE=HCAPLUS ABB=ON  PLU=ON  GRAPHITE# OR BLACK (2A)
                LEAD OR PLUMBAGO## OR L2
L6      2533705 SEA FILE=HCAPLUS ABB=ON  PLU=ON  ARTIFICIAL? OR SYNTHETIC
                ? OR SIMULAT? OR FABRICAT? OR MANMADE OR MAN (A) MADE OR
                ERSATZ OR SUBSTITUT?
L7       827599 SEA FILE=HCAPLUS ABB=ON  PLU=ON  SPHERICAL? OR ROUND? OR
                CIRCULAR? OR CURV? OR SPHERIOD##
L9            6 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L7 (2A) L5 AND L6 (2A)
                L5 AND L4
L12         133 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L7 (L) L5 AND L6 (L) L5
                (L) L4
L13       18855 SEA FILE=HCAPLUS ABB=ON  PLU=ON  MESOPHASE OR MESOPHASIC

L14       48953 SEA FILE=HCAPLUS ABB=ON  PLU=ON  PITCH##
L16           2 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 AND L12
L19           6 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 AND L14 AND L4 AND
                L5 AND L3
L20          51 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 (L) L14 (L) L4 (L)
                L5
L21          24 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13 (L) L14 (L) L4 (L)
                L5 AND ELECTRO?/SC,SC
L22          27 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L20 NOT L21
L23          25 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L22 AND (57? OR 51?)/SC

L26          25 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L23 NOT (L9 OR L16 OR
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L28          10 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L26 AND (ELECTRODE# OR
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L32           0 SEA FILE=JICST-EPLUS ABB=ON  PLU=ON  L9 OR L16 OR L19 OR
                L21 OR L28


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PROCESSING COMPLETED FOR L31
PROCESSING COMPLETED FOR L33
PROCESSING COMPLETED FOR L34
L35 53 DUP REM L29 L31 L33 L34 (3 DUPLICATES REMOVED)

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L35 ANSWER 1 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2005:523824 HCAPLUS
DN 143:46084
ED Entered STN: 17 Jun 2005
TI A process of production of carbon negative **electrode** material for lithium ion battery
IN Ma, Junqi; Wang, Jianqiao; Fu, Zhenming; Ding, Xiaoyang; Li, Shaoming; Zhang, Dianhao; Feng, Suning
PA Shanghai Shanshan Tech Co., Ltd., Peop. Rep. China
SO PCT Int. Appl., 13 pp.
CODEN: PIXXD2
DT Patent
LA Chinese
IC ICM H01M004-58
ICS H01M004-04; C01B031-00
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49, 51

FAN.CNT 1					
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2005055346	A1	20050616	WO 2004-CN1297	200411 15

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ,

DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRAI CN 2003-10108982 A 20031201

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2005055346	ICM	H01M004-58
	ICS	H01M004-04; C01B031-00
	IPCI	H01M0004-58 [ICM,7]; H01M0004-04 [ICS,7]; C01B0031-00 [ICS,7]

AB The present invention provides a carbon neg. **electrode** material for lithium ion battery by using natural **graphite**, esp. **spherical** natural **graphite** as raw material A, coal tar/coal pitch/petroleum pitch or mixt. thereof as raw material B, mixing the raw materials in a ratio of 1/0.5-10 of A to B, the resultant mixt. subjecting to polymn. reaction at a temp. of 350-500 °C under the pressure of 0.01 to 10 MPa for 5 to 420 min, drying the resultant product after extn. and sepn., the dried product having the wt. gain of 2-100 % compared with raw material of graphite, finally, carbonizing or graphitizing the product to obtain carbon neg. **electrode** material having a coated layer of artificial carbon or **artificial graphite**. The carbon neg. **electrode** material for lithium ion battery has advantages of high specific capacity, long cycle lifetime and the like, is a desirable carbon neg. **electrode** material.

ST carbonization graphitization graphite coal tar petroleum pitch battery anode

IT Electric capacitance
(high specific capacity; process of prodn. of carbon neg. **electrode** material for lithium ion battery)

IT Secondary batteries
(lithium; process of prodn. of carbon neg. **electrode** material for lithium ion battery)

IT Polymerization
(of graphite and pitches; process of prodn. of carbon neg. **electrode** material for lithium ion battery)

IT Battery anodes
Carbonization
Coal tar pitch
Drying
Extraction
Graphitization
Petroleum pitch
(process of prodn. of carbon neg. **electrode** material for lithium ion battery)

IT Coal tar
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(process of prodn. of carbon neg. **electrode** material for lithium ion battery)

IT 7782-42-5P, Graphite, uses
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(process of prodn. of carbon neg. **electrode** material for lithium ion battery)

IT 7440-44-0, Carbon, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(process of prodn. of carbon neg. **electrode** material

for lithium ion battery)
RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Fudan University; CN 1274957 A 2000 HCAPLUS
(2) He, M; Carbon 2002, V3, P3
(3) Jiang, H; Carbon 2001, V3, P12
(4) Shanghai Shanshan Tech Co Ltd; CN 1382624 A 2002 HCAPLUS
(5) Song, W; Chinese J Power Sources 2002, V26(6), P428 HCAPLUS
(6) Song, W; Study on composite materials prepared by coal pitch coating on natural flake Graphite used as carbon cathode materials for lithium ion secondary batteries 2001, V20(6), P27

L35 ANSWER 2 OF 53 INSPEC (C) 2005 IEE on STN
AN 2005:8473336 INSPEC DN A2005-16-8245-003; B2005-08-8410E-015
TI Study of **mesophase pitch**-based **graphite** foam used as anodic materials in lithium ion rechargeable batteries.
AU Jie Yang; Zeng-Min Shen; Rui-Sheng Xue (Inst. of Carbon Fibers & Composites, Beijing Univ. of Chem. Technol., China); Zhi-Biao Hao
SO Journal of Materials Science (1 March 2005) vol.40, no.5, p.1285-7. 15 refs.
Published by: Kluwer Academic Publishers
CODEN: JMTSAS ISSN: 0022-2461
SICI: 0022-2461(20050301)40:5L.1285:SMPB;1-5
DT Journal
TC Experimental
CY United States
LA English
AB We attempt to investigate the **mesophase pitch** carbon foams heat treated at high temperature as anode materials for lithium ion secondary batteries. The foaming technique used in this study is similar to that reported by Klett et al where powders of **mesophase pitch** were synthesized from FCC decant oil. The foams were characterized by X-ray diffraction. The **electrodes** were prepared by coating slurries of the carbon foams powder (90 wt%) polyvinylidene fluoride (PVDF, 10 wt%) dissolved in N-methyl pyrrolidinone (NMP) on **copper** foil. The carbon foams exhibit a superior anode performance with stable capacitance that can reach as high as 306 mAhg-1.
CC A8245 Electrochemistry and electrophoresis; A8630F Secondary cells; A8270R Aerosols and foams; A8120V Preparation of fullerenes and fullerene-related materials, intercalation compounds, and diamond; A8270K Emulsions and suspensions; A8140G Other heat and thermomechanical treatments; B8410E Secondary cells
CT CAPACITANCE; ELECTROCHEMICAL **ELECTRODES**; FOAMS; **GRAPHITE**; HEAT TREATMENT; SECONDARY CELLS; SLURRIES; X-RAY DIFFRACTION
ST **mesophase pitch-based graphite foam**; anodic materials; lithium ion rechargeable batteries; heat treatment; lithium ion secondary batteries; foaming technique; powders; FCC decant oil; X-ray diffraction; slurries; polyvinylidene fluoride; N-methyl pyrrolidinone; capacitance; C
CHI C el
ET N; C

L35 ANSWER 3 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:100617 HCAPLUS
DN 140:114301
ED Entered STN: 08 Feb 2004
TI Lithium rechargeable battery
IN Kato, Fumio; Oura, Takafumi; Fukumoto, Yusuke; Yamamoto, Norihiro; Fujiwara, Shozo
PA Matsushita Electric Industrial Co., Ltd., Japan

SO U.S. Pat. Appl. Publ., 18 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM H01M004-58
ICS H01M004-62; H01M004-66
INCL 429231800; 429245000; 429217000
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2004023115	A1	20040205	US 2003-620687	20030717
	JP 2004127913	A2	20040422	JP 2003-160969	20030605
	CN 1481041	A	20040310	CN 2003-152250	20030730

PRAI JP 2002-223862 A 20020731

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 2004023115	ICM	H01M004-58
	ICS	H01M004-62; H01M004-66
	INCL	429231800; 429245000; 429217000
	IPCI	H01M0004-58 [ICM,7]; H01M0004-62 [ICS,7]; H01M0004-66 [ICS,7]
	NCL	429/231.800
JP 2004127913	IPCI	H01M0004-02 [ICM,7]; H01M0002-02 [ICS,7]; H01M0004-58 [ICS,7]; H01M0004-62 [ICS,7]; H01M0004-66 [ICS,7]; H01M0010-40 [ICS,7]
	FTERM	5H011/AA03; 5H011/AA09; 5H011/AA13; 5H011/BB03; 5H011/CC06; 5H011/CC10; 5H017/AA03; 5H017/AS01; 5H017/AS10; 5H017/CC01; 5H017/EE01; 5H017/HH05; 5H029/AJ02; 5H029/AJ03; 5H029/AJ05; 5H029/AJ12; 5H029/AK03; 5H029/AL07; 5H029/AM03; 5H029/AM05; 5H029/AM07; 5H029/BJ02; 5H029/BJ14; 5H029/CJ02; 5H029/CJ08; 5H029/DJ02; 5H029/DJ08; 5H029/DJ16; 5H029/DJ17; 5H029/EJ01; 5H029/EJ03; 5H029/EJ13; 5H029/HJ01; 5H029/HJ05; 5H029/HJ07; 5H029/HJ08; 5H029/HJ13; 5H029/HJ14; 5H050/AA02; 5H050/AA06; 5H050/AA07; 5H050/AA08; 5H050/AA15; 5H050/AA19; 5H050/BA17; 5H050/CA08; 5H050/CB08; 5H050/DA11; 5H050/EA28; 5H050/FA05; 5H050/FA17; 5H050/FA19; 5H050/GA02; 5H050/GA05; 5H050/GA06; 5H050/GA10; 5H050/HA01; 5H050/HA05; 5H050/HA07; 5H050/HA08; 5H050/HA13; 5H050/HA14
CN 1481041	IPCI	H01M0004-58 [ICM,7]; H01M0004-62 [ICS,7]; H01M0010-36 [ICS,7]; H01M0010-40 [ICS,7]

AB The present invention provides a lithium rechargeable battery including a neg. **electrode** comprising a **copper** core material, to which is fixed an active material made by mixing **artificial graphite** particles obtained by kneading and granulating a base material of pulverized bulk **mesophase pitch** with **pitch** in a softened state and/or thermosetting resin, carbonizing the resulting granules at 700 to 1500° and graphitizing the carbonized granules at 2500 to 3000° with **spherical graphite** particles

having a high mean **circularity**, with a view to inhibiting the deterioration in battery capacity through the repeated charge/discharge cycles, which occurs remarkably in a high energy d. lithium rechargeable battery, and providing excellent discharge characteristic and safety.

ST battery lithium secondary; safety lithium rechargeable battery

IT Battery anodes
Battery **cathodes**
Coal tar **pitch**
Mesophase pitch
(lithium rechargeable battery)

IT Coal tar
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(lithium rechargeable battery)

IT Secondary batteries
(lithium; lithium rechargeable battery)

IT Plastics, uses
RL: MOA (Modifier or additive use); USES (Uses)
(thermosetting; lithium rechargeable battery)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 623-53-0, Ethyl methyl carbonate **7440-50-8**, **Copper**, uses **7782-42-5**, **Graphite**, uses 12190-79-3, Cobalt lithium oxide colio2 21324-40-3, Lithium hexafluorophosphate
RL: DEV (Device component use); USES (Uses)
(lithium rechargeable battery)

L35 ANSWER 4 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:900943 HCAPLUS
DN 141:382112
ED Entered STN: 28 Oct 2004
TI Production of spherical graphite particles and its use in lithium ion secondary battery cathode material
IN Sakai, Minoru; Nagayama, Katsuhiro; Hatano, Hitomi; Morioka, Hironori; Honma, Makoto
PA JFE Chemical Corporation, Japan
SO Jpn. Kokai Tokkyo Koho, 17 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C01B031-04
ICS H01M004-02; H01M004-58; H01M010-40
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004299944	A2	20041028	JP 2003-93308	20030331

PRAI JP 2003-93308 20030331

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 2004299944	ICM	C01B031-04
	ICS	H01M004-02; H01M004-58; H01M010-40
	IPCI	C01B0031-04 [ICM,7]; H01M0004-02 [ICS,7]; H01M0004-58 [ICS,7]; H01M0010-40 [ICS,7]
	FTERM	4G146/AA02; 4G146/AA23; 4G146/AB01; 4G146/AB02;

4G146/AC02A; 4G146/AC02B; 4G146/AC17A;
4G146/AC17B; 4G146/AC22A; 4G146/AC22B;
4G146/AD03; 4G146/AD11; 4G146/AD25; 4G146/BA22;
4G146/BA23; 4G146/BA43; 4G146/BA49; 4G146/BB03;
4G146/BB06; 4G146/BB18; 4G146/BC04; 4G146/BC32A;
4G146/BC32B; 5H029/AJ03; 5H029/AJ05; 5H029/AK02;
5H029/AK03; 5H029/AK05; 5H029/AK08; 5H029/AL07;
5H029/AM02; 5H029/AM03; 5H029/AM04; 5H029/AM05;
5H029/AM07; 5H029/AM16; 5H029/BJ03; 5H029/CJ02;
5H029/CJ08; 5H029/EJ12; 5H029/HJ01; 5H029/HJ05;
5H029/HJ06; 5H029/HJ08; 5H029/HJ10; 5H029/HJ13;
5H029/HJ14; 5H050/AA07; 5H050/AA08; 5H050/BA17;
5H050/CA02; 5H050/CA11; 5H050/CA16; 5H050/CB08;
5H050/EA24; 5H050/GA02; 5H050/GA10; 5H050/HA01;
5H050/HA05; 5H050/HA06; 5H050/HA08; 5H050/HA13;
5H050/HA14

AB Spherical **graphite** particles are produced from **mesophase pitch** micro beads (av. grain diam. 20-60 μm) by calcining at 350-450° to obtain **graphite** precursors contg. 4-20 wt.% volatile matter, and then graphitizing at ≥2000°, preferably 2800-3200° to obtain cryst. **graphite** particles having apparent sp. gr. 6.0 (detd. by JIS R7222-1997), d. 2.210-2.240 g/cm3, and inner pore diam. 0.1-30 μm. The secondary battery **cathode** has larger service capacity around cubic measure, and does not cause deterioration in cycle quality.

ST secondary lithium battery cathode graphite particle size control

IT **Mesophase pitch**
(coal tar; prodn. of spherical **graphite** particles and its use in lithium ion secondary battery **cathode** material)

IT Coal tar **pitch**
(**mesophase**; prodn. of spherical **graphite** particles and its use in lithium ion secondary battery **cathode** material)

IT Battery cathodes
(prodn. of spherical graphite particles and its use in lithium ion secondary battery cathode material)

IT 7440-44-0, Carbon, uses
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(meso phase; micro beads; prodn. of spherical graphite particles and its use in lithium ion secondary battery cathode material)

IT 7782-42-5P, Graphite, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(prodn. of spherical graphite particles and its use in lithium ion secondary battery cathode material)

L35 ANSWER 5 OF 53 INSPEC (C) 2005 IEE on STN DUPLICATE 1
AN 2005:8414410 INSPEC DN A2005-13-8245-011; B2005-07-8410E-001
TI Anomalous improvement of the electrochemical properties of mesocarbon microbeads by Ar-H2-SF6 thermal plasma treatment.
AU Tanaka, H.; Xu, J.Y. (Nat. Inst. for Mater. Sci., Ibaraki, Japan); Kurihara, M.; Maruyama, S.; Ohashi, N.; Moriyoshi, Y.; Ishigaki, T.
SO Carbon (2004) vol.42, no.15, p.3229-35. 22 refs.
Published by: Elsevier
Price: CCCC 0008-6223/2004/$30.00
CODEN: CRBNAH ISSN: 0008-6223
SICI: 0008-6223(2004)42:15L.3229:AIEP;1-5
DT Journal
TC Practical; Experimental

CY United Kingdom
LA English
AB Highly graphitized mesocarbon microbead (MCMB) powders, which consist of **spherical artificial graphite** particles, were treated in Ar-H2-SF6 radio-frequency inductively coupled thermal plasma. The results of X-ray diffractometry, scanning electron microscopy, Fourier transform infrared spectroscopy, Raman spectroscopy, X-ray photoelectron spectroscopy, and element analysis showed that the plasma treatment greatly affected the surface structure and chemical composition of the MCMB powders. Sulfur and fluorine could be incorporated into the particle by treating them with plasma containing SF6, and this plasma modification improved the electrochemical properties of the powders. A lithium-ion rechargeable cell with a negative **electrode** of plasma-treated powder had a discharge capacity as much as 13% greater than that of a cell with a negative **electrode** of untreated powder, while its irreversible capacity loss (ICL) was as much as 9% less. The specific ICL calculated by dividing the ICL by surface area decreased as the BET surface area increased. Furthermore, a new plateau near 2 V was added to the discharge curve by treating the MCMB powder with SF6 plasma but not by treating it with Ar-H2, Ar-N2, Ar-H2-CO2, or Ar-N2-CO2 plasmas. The incorporation of sulfur and fluorine should be a key factor for the improvement of negative **electrode** characteristics.
CC A8245 Electrochemistry and electrophoresis; A8280P Electron spectroscopy for chemical analysis (photoelectron, Auger spectroscopy, etc.); A7830G Infrared and Raman spectra in inorganic crystals; A7960 Photoemission and photoelectron spectra (condensed matter); A5250G Plasma heating; A8630F Secondary cells; A6820 Solid surface structure; B8410E Secondary cells
CT ELECTROCHEMICAL **ELECTRODES**; ELECTROCHEMISTRY; FLUORINE; FOURIER TRANSFORM SPECTRA; GRAPHITE; INFRARED SPECTRA; PLASMA RADIOFREQUENCY HEATING; POWDERS; RAMAN SPECTRA; SCANNING ELECTRON MICROSCOPY; SECONDARY CELLS; SULPHUR; SURFACE STRUCTURE; X-RAY DIFFRACTION; X-RAY PHOTOELECTRON SPECTRA
ST electrochemical properties; mesocarbon microbeads; **spherical artificial graphite particles**; X-ray diffractometry; scanning electron microscopy; Fourier transform infrared spectroscopy; Raman spectroscopy; X-ray photoelectron spectroscopy; element analysis; surface structure; chemical composition; irreversible capacity loss; sulfur; fluorine; **negative electrode**; radio-frequency inductively coupled thermal plasma; Li; C
CHI Li el; C sur, C el
ET Ar*F*H*S; SF6; S cp; cp; F cp; Ar-H2-SF6; F*S; Ar*H; Ar-H2; Ar*N; Ar-N2; C*H*Ar*O; CO2; C cp; O cp; Ar-H2-CO2; C*Ar*N*O; Ar-N2-CO2; Li; C

L35 ANSWER 6 OF 53 COMPENDEX COPYRIGHT 2005 EEI on STN
AN 2004(31):7670 COMPENDEX
TI Effect of intercalation on electrical and mechanical properties of C/C composites.
AU Macherzynska, B. (Department of Advanced Ceramics Fac. of Mat. Science and Ceramics AGH Univ. of Science and Technology, 30-059 Crakow, Poland); Blazewicz, S.
SO Journal of Physics and Chemistry of Solids v 65 n 10 October 2004 2004.p 1745-1750
CODEN: JPCSAW ISSN: 0022-3697
PY 2004
DT Journal
TC Experimental
LA English
AB The work is concerned with modification of C/C composites by

intercalation of **copper** chloride. The samples of composites were made from **graphite** fibres and carbon matrix derived from **mesophase pitch** and from phenol-formaldehyde resin. The samples were prepared by impregnating **graphite** fibres with a liquid **pitch** or polymer solution to obtain unidirectional laminates. The laminates were used to prepare the composites which were then subjected to carbonization and graphitization up to 2150deg C. The work discusses the problem relevant to the effect of intercalation on mechanical and electrical properties of composites. The studies indicated that both **mesophase pitch**-based composites and phenolic-derived carbon-carbon composites changed their electrical and mechanical properties upon intercalation with **copper** chloride. Electrical conductivity of both types of composites decreased as a result of the damages formed during intercalation. 17 Refs.

CC 415.4 Other Structural Materials; 701.1 Electricity: Basic Concepts and Phenomena; 704.1 Electric Components; 801.4.1 Electrochemistry; 802.2 Chemical Reactions

CT *Carbon carbon composites; **Electrodes**; Electrochemistry; Mechanical properties; Graphitization; Electric conductivity; Carbonization; Intercalation compounds

ST Gaseous precursors; Electrochemical devices; Acceptor molecules

L35 ANSWER 7 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2003:773819 HCAPLUS

DN 139:294631

ED Entered STN: 03 Oct 2003

TI Lithium ion secondary battery showing good charge-discharge cycle characteristics

IN Nishikawa, Reiji; Yoda, Kiyoto; Suzuki, Masami; Shikoda, Masataka

PA Toshiba Battery Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M010-40
ICS H01M004-48; H01M004-62

CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2003282147	A2	20031003	JP 2002-86994	200203 26

PRAI JP 2002-86994 20020326

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 2003282147	ICM	H01M010-40
	ICS	H01M004-48; H01M004-62
	IPCI	H01M0010-40 [ICM,7]; H01M0004-48 [ICS,7]; H01M0004-62 [ICS,7]

AB The title battery is equipped with: an anode which contains niobium pentaoxide, electroconductive materials, and a binder; **cathode** which carbon material electrochem. binding and releasing lithium and a binder; and nonaq. electrolyte, wherein the electroconductive material of the the anode is made of a mixt. of carbon black chosen from acetylene black, ketjen black, oil black, furnace black and **graphite** chosen from natural

graphite, artificial graphite, expanded graphite, mesophase graphite pitch, mesophase graphite fiber and wherein the binder of cathode is made of a mixt. of rubber polymer chosen from SBR, NBR, and MBR and cellulose or CMC or polyacrylic acid deriv. chosen from polyacrylic acid, ammonium polyacrylate, and lithium polyacrylate. The battery shows excellent properties on the charge-discharge cycle.

ST lithium ion secondary battery

IT Anodes
Cathodes
(lithium ion secondary battery)

IT Carbon black, uses
Styrene-butadiene rubber, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(lithium ion secondary battery)

IT Secondary batteries
(lithium ion; lithium ion secondary battery)

IT Carbon fibers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(mesophase pitch-based; lithium ion secondary battery)

IT 1313-96-8, Niobium pentaoxide 7782-42-5, Graphite, uses
9003-01-4, Polyacrylic acid
RL: TEM (Technical or engineered material use); USES (Uses)
(lithium ion secondary battery)

IT 9003-55-8
RL: TEM (Technical or engineered material use); USES (Uses)
(styrene-butadiene rubber, lithium ion secondary battery)

L35 ANSWER 8 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:964681 HCAPLUS
DN 138:42042
ED Entered STN: 20 Dec 2002
TI Improved cathodes for alkaline batteries
IN Zeng, Shuming
PA The Gillette Company, USA
SO PCT Int. Appl., 32 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM H01M004-62
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002101856	A2	20021219	WO 2002-US17746	20020606
WO 2002101856	A3	20040401		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

US 2003008211	A1	20030109	US 2001-880651	

					200106 13
US 6596438		B2	20030722		
EP 1425812		A2	20040609	EP 2002-739693	200206 06
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
BR 2002010308		A	20040928	BR 2002-10308	200206 06
JP 2005518633		T2	20050623	JP 2003-504491	200206 06
PRAI US 2001-880651		A1	20010613		
WO 2002-US17746		W	20020606		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2002101856	ICM	H01M004-62
	IPCI	H01M0004-62 [ICM,7]
US 2003008211	IPCI	H01M0004-62 [ICM,7]; H01M0004-50 [ICS,7]; H01M0004-42 [ICS,7]; H01M0010-26 [ICS,7]
	NCL	429/229.000
EP 1425812	IPCI	H01M0004-62 [ICM,7]
BR 2002010308	IPCI	H01M0004-62 [ICM,7]
JP 2005518633	IPCI	H01M0006-08 [ICM,7]; H01M0004-50 [ICS,7]; H01M0004-62 [ICS,7]
	FTERM	5H024/AA03; 5H024/AA14; 5H024/BB01; 5H024/CC02; 5H024/DD17; 5H024/EE03; 5H024/FF08; 5H024/HH00; 5H024/HH01; 5H024/HH11; 5H024/HH13; 5H050/AA02; 5H050/AA12; 5H050/BA03; 5H050/CA05; 5H050/CB13; 5H050/DA10; 5H050/EA09; 5H050/FA07; 5H050/FA16; 5H050/GA02; 5H050/HA01; 5H050/HA04; 5H050/HA07; 5H050/HA13; 5H050/HA14

AB The title battery has a cathode comprising manganese dioxide and graphitized carbon fibers with an av. BET surface area of 10-60 m2/g. Optionally, graphitized mesophase pitch-based carbon fibers can be used instead of graphitized carbon fibers. The graphitized mesophase pitch-based carbon fibers may be heat treated at 800-1200° with KOH. The use of graphitized carbon fibers in the cathode increases cathode cond. and results in improved battery performance.

ST battery alk graphitized carbon fiber cathode; graphitized mesophase pitch based carbon fiber cathode battery

IT Battery cathodes
Primary batteries
(cathodes contg. graphitized carbon fibers for alk. batteries)

IT Carbon fibers, uses
RL: DEV (Device component use); USES (Uses)
(**graphite, mesophase pitch**-based, TA 1F, DKE-X, 42C, 42D, LB 3F; **cathodes** contg. graphitized carbon fibers for alk. batteries)

IT Carbon fibers, uses
RL: DEV (Device component use); USES (Uses)
(graphite; cathodes contg. graphitized carbon fibers for alk. batteries)

IT 7782-42-5, Graphite, uses
RL: DEV (Device component use); USES (Uses)
(DCN 2, MP 0702X; cathodes contg. graphitized carbon fibers and flaky cryst. or expanded graphite for alk. batteries)

IT 7440-66-6, Zinc, uses

RL: DEV (Device component use); USES (Uses)
(anode; cathodes contg. graphitized carbon fibers for alk. batteries with)

IT 1310-58-3, Potassium hydroxide (KOH), uses
RL: DEV (Device component use); NUU (Other use, unclassified); USES (Uses)
(electrolyte and heat treating agent; cathodes contg. graphitized carbon fibers for alk. batteries)

IT 1313-13-9, Manganese dioxide, uses
RL: DEV (Device component use); USES (Uses)
(electrolytic, cathode; cathodes contg. graphitized carbon fibers for alk. batteries)

L35 ANSWER 9 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:172340 HCAPLUS
DN 136:202906
ED Entered STN: 08 Mar 2002
TI Processes for producing coke, artificial graphite and carbon material for negative **electrode** of non-aqueous solvent type secondary battery and pitch composition used therefor
IN Kanno, Koichi; Tsuruya, Hirotaka; Fujiura, Ryuji
PA Japan
SO U.S. Pat. Appl. Publ., 6 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM C10B047-00
ICS C10G001-00
INCL 201001000
CC **51-10** (Fossil Fuels, Derivatives, and Related Products)
Section cross-reference(s): 52, 57

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002027066	A1	20020307	US 2001-923373	20010808
	JP 2002083595	A2	20020322	JP 2000-270315	20000906
	EP 1186646	A2	20020313	EP 2001-119188	20010809
	EP 1186646	A3	20030502		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
PRAI	JP 2000-270315	A	20000906		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 20020027066	ICM	C10B047-00
	ICS	C10G001-00
	INCL	201001000
	IPCI	C10B0047-00 [ICM,7]; C10G0001-00 [ICS,7]
	NCL	201/001.000
	ECLA	C01B031/04; C10B055/00; H01M004/58E2
JP 2002083595	IPCI	H01M0004-58 [ICM,7]; C01B0031-00 [ICS,7]; C01B0031-04 [ICS,7]; C10B0057-04 [ICS,7]; C10C0003-02 [ICS,7]; H01M0004-02 [ICS,7]; H01M0010-40 [ICS,7]
EP 1186646	IPCI	C10C0003-00 [ICM,6]; C10B0055-00 [ICS,6];

C01B0031-04 [ICS,6]; H01M0004-58 [ICS,6];
H01M0010-40 [ICS,6]
ECLA C01B031/04; C10B055/00; H01M004/58E2

AB When a **pitch** compn., prepd. by mixing 100 wt. parts of **mesophase pitch** with 10-1,000 wt. parts of coal-tar **pitch**, is heat-treated at ≥500°, it is possible to produce a high-d. coke at a high yield while avoiding foaming of the **mesophase pitch**. In addn., when the coke is graphitized at ≥2,000°, it is possible to obtain an artificial **graphite** having a high graphitization degree. Further, when the coke is first pulverized and then graphitized at ≥2,000°, it is possible to obtain a high-crystallinity **graphite** powder which can be suitably used as a C material for a neg. **electrode** of non-aq. solvent type secondary battery having a high discharge capacity and a high charge-discharge efficiency.

ST coke manuf pitch; graphitization pitch coke; battery anode graphite manuf

IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(as binder in manuf. of graphite anodes)

IT Coal tar pitch
Mesophase pitch
(in pitch coke manuf)

IT Battery anodes
(manuf. from graphitized pitch coke)

IT Graphitization
(of pitch coke)

IT Coke
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(pitch; manuf. from mesophase pitch and coal-tar pitch)

IT 24937-79-9, Polyvinylidene fluoride
RL: TEM (Technical or engineered material use); USES (Uses)
(as binder in manuf. of graphite anodes)

IT 91-20-3, Naphthalene, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(in manuf. of mesophase pitch)

IT 7782-42-5P, Graphite, preparation
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); PREP (Preparation); PROC (Process)
(manuf. from pitch coke)

L35 ANSWER 10 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:924152 HCAPLUS
DN 142:159400
ED Entered STN: 03 Nov 2004
TI Organic electrolytes for secondary lithium batteries with carbon-based anodes
IN Do, Chil Hun; Mun, Seong In
PA Il Dong Chemical Co., Ltd., S. Korea; Korea Electro Technology Research Institute
SO Repub. Korean Kongkae Taeho Kongbo, No pp. given
CODEN: KRXXA7
DT Patent
LA Korean
IC ICM H01M004-36
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

PI	KR 2002048814	A	20020624	KR 2000-78088	200012 18
PRAI	KR 2000-78088		20001218		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
KR 2002048814	ICM	H01M004-36
	IPCI	H01M0004-36 [ICM,7]

AB This org. electrolytic soln. consists of EC and PC for a Li battery with a **graphite**-based C anode. The battery has enhanced output power and increased energy d. due to a decrease in the irreversible sp. capacity of the assistant C **electrode.** The soln. consists of 0.8-33 vol.% propylene carbonate, 43-29 vol.% ethylene carbonate, and 56-38 vol.% di-Et carbonate, di-Me carbonate, ethyl-Me carbonate and methyl-Pr carbonate; and Li salt at 0.7-1.3M. When **mesophase** carbon microbeads (MCMB) is used as anode material, the electrolytic soln. comprises 0.8-20 vol.% PC, 45-35 vol.% EC, 56-45 vol.% di-Et carbonate. When the **pitch** coated **graphite** (PCG) is used as the anode material, the electrolytic soln. comprises 0.8-15 vol.% PC, 43-37 vol.% EC, 56-48 vol.% di-Et carbonate. When the hard C is used as the anode material, the electrolytic soln. comprises 0.8-20 vol.% PC, 45-35 vol.% EC, 56-45 vol.% di-Et carbonate.

ST org electrolyte carbon graphite anode lithium battery

IT Secondary batteries
(lithium; org. electrolytes for secondary lithium batteries with carbon-based anodes)

IT Battery anodes
Battery electrolytes
(org. electrolytes for secondary lithium batteries with carbon-based anodes)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl-methyl carbonate 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses 56525-42-9, Methyl-propyl carbonate
RL: DEV (Device component use); USES (Uses)
(org. electrolytes for secondary lithium batteries with carbon-based anodes)

L35 ANSWER 11 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:913949 HCAPLUS
DN 142:97410
ED Entered STN: 01 Nov 2004
TI Coating of carbon cathode material for lithium secondary batteries
IN Han, Sang Cheol; Han, Yeong Su; Kang, Yong Muk; Lee, Jae Yeong; Park, Seong Cheol
PA Korea Advanced Institute of Science and Technology, S. Korea
SO Repub. Korean Kongkae Taeho Kongbo, No pp. given
CODEN: KRXXA7
DT Patent
LA Korean
IC ICM H01M004-02
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI KR 2002010843	A	20020206	KR 2000-44367	

200007
31

PRAI KR 2000-44367 20000731

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
KR 2002010843	ICM	H01M004-02
	IPCI	H01M0004-02 [ICM,7]

AB This method for coating a highly cryst. C **cathode** material confers excellent surface characteristics which provides a battery with high energy d. and good performance. The highly cryst. C is coated with a pyrolytic C by pyrolysis of a hydrocarbon gas by tumbling CVD. The cryst. C material is selected from natural **graphite**, Kish **graphite**, SFG series, highly oriented pyrolytic **graphite**, **mesophase** **pitch** based C fiber (MPCF), and MCMB series and the hydrocarbon gas is selected from LPG, methane, butane, and benzene.

ST carbon cathode pyrolytic carbon coating lithium battery

IT Petroleum products
(gases, liquefied; in pyrolytic carbon coating of carbon-based cathode material for lithium secondary batteries)

IT Secondary batteries
(lithium; pyrolytic carbon coating of carbon-based cathode material for lithium secondary batteries)

IT Carbon fibers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(mesophase pitch-based; pyrolytic carbon coating of carbon-based cathode material for lithium secondary batteries)

IT Battery cathodes
(pyrolytic carbon coating of carbon-based cathode material for lithium secondary batteries)

IT 71-43-2, Benzene, processes 74-82-8, Methane, processes 106-97-8, Butane, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(in pyrolytic carbon coating of carbon-based cathode material for lithium secondary batteries)

IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(pyrolytic carbon coating of carbon-based cathode material for lithium secondary batteries)

L35 ANSWER 12 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:773879 HCAPLUS
DN 137:297338
ED Entered STN: 11 Oct 2002
TI Nonaqueous electrolyte secondary battery
IN Ota, Hideo; Kishi, Takashi
PA Toshiba Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M010-40
ICS H01M010-40; H01M004-02; H01M004-58
CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 76

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2002298915	A2	20021011	JP 2001-98184	

200103
30

PRAI JP 2001-98184 20010330

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 2002298915	ICM	H01M010-40
	ICS	H01M010-40; H01M004-02; H01M004-58
	IPCI	H01M0010-40 [ICM,7]; H01M0010-40 [ICS,7]; H01M0004-02 [ICS,7]; H01M0004-58 [ICS,7]

AB The battery is characterized by having good discharge capacity, charging cycle life time, and is capable of avoiding cracking, firing, and sudden temp. increase when large elec. current occurs during nail sticking short circuit test. The battery comprises a pos. **electrode** having active material contg. lithium oxide and ≥1 metals selected from Al, Co, Fe, Mn, Ga, Ru, and Nb, a neg. **electrode**, and a nonaq. electrolyte substrate contg. phosphate ester and vinylene carbonate (such as ethylene carbonate and methylethyl carbonate).

ST nonaq electrolyte secondary battery active material

IT Esters, uses
RL: DEV (Device component use); USES (Uses)
(Phosphate; nonaq. electrolyte secondary battery using phosphate ester and vinylene carbonate)

IT **Mesophase pitch**
Secondary batteries
(nonaq. electrolyte secondary battery using phosphate ester and vinylene carbonate)

IT Carbon black, uses
Carbon fibers, uses
Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(nonaq. electrolyte secondary battery using phosphate ester and vinylene carbonate)

IT 78-40-0, Triethyl phosphate 96-49-1, Ethylene carbonate
108-32-7, Propylene carbonate 512-56-1, Trimethyl phosphate
616-38-6, Dimethyl carbonate 623-53-0, Methylethylcarbonate
872-36-6, Vinylene carbonate 10463-05-5, Dimethylethylphosphate
RL: TEM (Technical or engineered material use); USES (Uses)
(nonaq. electrolyte secondary battery prepn.; nonaq. electrolyte secondary battery using phosphate ester and vinylene carbonate)

IT 12057-24-8, Lithium oxide, uses
RL: DEV (Device component use); USES (Uses)
(nonaq. electrolyte secondary battery using phosphate ester and vinylene carbonate)

IT 7439-96-5, Manganese, uses 7440-03-1, Niobium, uses 7440-18-8, Ruthenium, uses 7440-48-4, Cobalt, uses 7440-55-3, Gallium, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(nonaq. electrolyte secondary battery using phosphate ester and vinylene carbonate)

IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses
7440-50-8, **Copper**, uses **7782-42-5**, **Graphite**, uses 9002-88-4, Polyethylene 24937-79-9, Polyvinylidene fluoride
RL: TEM (Technical or engineered material use); USES (Uses)
(nonaq. electrolyte secondary battery using phosphate ester and vinylene carbonate)

L35 ANSWER 13 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:253368 HCAPLUS
DN 136:265837

ED Entered STN: 05 Apr 2002
TI Graphite material for secondary lithium battery anode and its manufacture
IN Okamura, Kaichiro; Takai, Yasuyuki; Sudo, Yoshinori
PA Petoca Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-58
ICS C01B031-04; H01M004-02; H01M010-40
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2002100359	A2	20020405	JP 2000-291916	20000926

PRAI JP 2000-291916 20000926

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 2002100359	ICM	H01M004-58
	ICS	C01B031-04; H01M004-02; H01M010-40
	IPCI	H01M0004-58 [ICM,7]; C01B0031-04 [ICS,7]; H01M0004-02 [ICS,7]; H01M0010-40 [ICS,7]

AB The **graphite** has d002 ≤0.336 nm, Lc ≥100 nm, La ≥100 nm, and I100/I101 >1.6 [I100 and I101 are the intensities of diffraction peaks for its (100) and (101) faces] on its x ray diffraction pattern. The **graphite** material is prepd. by directly heating milled **mesophase pitch** derived carbon fibers, by applying a current through the fibers via a pair of **electrodes**, in a fluidized bed furnace with a controlled atm.
ST lithium battery anode graphite manuf carbon fiber; cryst characteristic graphite secondary lithium battery anode
IT Battery anodes
(cryst. structure and manuf. of graphite from carbon fibers for secondary lithium battery anodes)
IT Carbon fibers, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(milled mesophase pitch derived carbon fibers for manuf. of graphite for secondary lithium battery anodes)
IT 7782-42-5P, Graphite, uses
RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(cryst. structure and manuf. of graphite from carbon fibers for secondary lithium battery anodes)

L35 ANSWER 14 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:183906 HCAPLUS
DN 136:234637
ED Entered STN: 15 Mar 2002
TI Nonaqueous electrolyte secondary battery for portable electronic appliances
IN Satoh, Asako; Fujiwara, Masashi; Koiwa, Kaoru; Sekino, Masahiro; Shimura, Nao; Hasebe, Hiroyuki; Oguchi, Masayuki; Onumai, Masayuki
PA Kabushiki Kaisha Toshiba, Japan
SO Eur. Pat. Appl., 39 pp.

CODEN: EPXXDW
DT Patent
LA English
IC ICM H01M010-40
ICS H01M004-58
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1187245	A2	20020313	EP 2001-307571	200109 06
	EP 1187245	A3	20040421		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	US 2002055047	A1	20020509	US 2001-945808	200109 05
	US 6852451	B2	20050208		
	JP 2002329529	A2	20021115	JP 2001-269299	200109 05
	CN 1343022	A	20020403	CN 2001-132683	200109 06
PRAI	JP 2000-270529	A	20000906		
	JP 2001-54938	A	20010228		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 1187245	ICM	H01M010-40
	ICS	H01M004-58
	IPCI	H01M0010-40 [ICM,6]; H01M0004-58 [ICS,6]
	ECLA	H01M004/58E2; H01M010/40L2
US 2002055047	IPCI	H01M0010-40 [ICM,7]; H01M0002-02 [ICS,7]
	NCL	429/337.000
	ECLA	H01M004/58E2; H01M010/40L2
JP 2002329529	IPCI	H01M0010-40 [ICM,7]; H01M0010-40 [ICS,7]; H01M0002-02 [ICS,7]; H01M0004-58 [ICS,7]
CN 1343022	IPCI	H01M0010-36; H01M0010-40

AB Disclosed is a nonaq. electrolyte secondary battery, comprising a case having a wall thickness not larger than 0.3 mm, a pos. **electrode** provided in the case, a neg. **electrode** provided in the case and the neg. **electrode** contg. a carbonaceous material capable of absorbing-desorbing lithium ions, and a nonaq. electrolyte provided in the case and the nonaq. electrolyte contg. a nonaq. solvent including γ-butyrolactone and a solute dissolved in the nonaq. solvent, wherein after being discharged to 3-V with a current of 0.2-C at room temp., the voltage redn. caused by the self-discharge at 60° is not larger than 1.5 V in 3 wk.

ST battery nonaq electrolyte portable electronic appliance use

IT Carbon fibers, uses
RL: DEV (Device component use); USES (Uses)
(**mesophase pitch**-based; nonaq. electrolyte secondary battery for portable electronic appliances)

IT Electric apparatus
Secondary batteries
(nonaq. electrolyte secondary battery for portable electronic appliances)

IT Carbonaceous materials (technological products)
RL: DEV (Device component use); USES (Uses)
(nonaq. electrolyte secondary battery for portable electronic appliances)
IT Carbon black, uses
Fluoropolymers, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(nonaq. electrolyte secondary battery for portable electronic appliances)
IT **Mesophase pitch**
(precursor for carbonaceous material; nonaq. electrolyte secondary battery for portable electronic appliances)
IT 96-49-1, Ethylene carbonate 7429-90-5, Aluminum, uses **7440-50-8, Copper**, uses 9002-88-4, Polyethylene 12190-79-3, Cobalt lithium oxide colio2 14283-07-9, Lithium tetrafluoroborate
RL: DEV (Device component use); USES (Uses)
(nonaq. electrolyte secondary battery for portable electronic appliances)
IT 96-48-0, γ-Butyrolactone **7782-42-5, Graphite**, uses 24937-79-9, Pvdf
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(nonaq. electrolyte secondary battery for portable electronic appliances)
IT 7439-93-2, Lithium, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(nonaq. electrolyte secondary battery for portable electronic appliances)
IT 872-50-4, n-Methylpyrrolidone, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(nonaq. electrolyte secondary battery for portable electronic appliances)

L35 ANSWER 15 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:811781 HCAPLUS
DN 137:327379
ED Entered STN: 25 Oct 2002
TI Continuous production of trilaminates by coextrusion for polymer lithium batteries
IN Naarmann, Herbert; Kruger, Franz Josef; Schaefer, Tim
PA Dilo Trading A.-G., Switz.
SO Ger. Offen., 10 pp.
CODEN: GWXXBX
DT Patent
LA German
IC ICM H01M010-38
ICS H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 10118639	A1	20021024	DE 2001-10118639	200104 12

PRAI DE 2001-10118639 20010412
CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
DE 10118639	ICM	H01M010-38
	ICS	H01M010-40
	IPCI	H01M0010-38 [ICM,7]; H01M0010-40 [ICS,7]
	ECLA	H01M010/38; H01M010/40L2

AB The invention concerns the prodn. of Trilamainates, consisting of an anode composite, polymer electrolytes and a **cathode** composite, which are provided on the **cathode** side and on the anode side with a metallic grid. The prodn. is carried out continuously, preferably via coextrusion. The systems thus obtained form the basis for rechargeable polymer lithium batteries. The procedure according to invention contains the prodn. of anode masses, **cathode** material as well as the polymer gel electrolyte, which are: (1) homogeneously developed, (2) agree in structural viscosity and rheol., and (3) defined in shape by extrusion; and can be continuously formed as bands with reproducible wts. and laminated. The anode mass consists of **graphite**, preferably **synthetic**, e.g., mesocarbon microbeads with **spherical** particles or **graphite** fibers as well as a polymer binder e.g. polyfluoroelastomeres, polyolefins, polybutadiene or styrene copolymers, as well as polymethacrylates with alc. residues C4-C20, and polyvinyl compds. such as polyvinylpyrrolidone, polyvinylimidazole, polyvinylpyridin etc. and their copolymers, e.g. with methacrylic acid ester with alc. residues C4-C20, and a conducting salt e.g., LiPF6 or Li oxalato borates, etc.

ST lithium secondary battery polymer trilaminate coextrusion

IT Battery anodes
Battery **cathodes**
Extrusion of plastics and rubbers
Laminated materials
(continuous prodn. of trilaminates by coextrusion for polymer lithium batteries)

IT Fluoro rubber
Isoprene-styrene rubber
Polyolefins
RL: DEV (Device component use); USES (Uses)
(continuous prodn. of trilaminates by coextrusion for polymer lithium batteries)

IT Zeolites (synthetic), uses
RL: MOA (Modifier or additive use); USES (Uses)
(continuous prodn. of trilaminates by coextrusion for polymer lithium batteries)

IT Carbon fibers, uses
RL: DEV (Device component use); USES (Uses)
(graphite; continuous prodn. of trilaminates by coextrusion for polymer lithium batteries)

IT Secondary batteries
(lithium; continuous prodn. of trilaminates by coextrusion for polymer lithium batteries)

IT Battery electrolytes
(polymer gel; continuous prodn. of trilaminates by coextrusion for polymer lithium batteries)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate 9003-17-2, Polybutadiene 9003-39-8, Polyvinylpyrrolidone 9003-47-8, Polyvinylpyridine 9003-53-6, Polystyrene 12031-65-1, Lithium nickel oxide linio2 12057-17-9, Lithium manganese oxide limn2o4 12190-79-3, Cobalt lithium oxide colio2 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 25087-26-7D, Polymethacrylic acid, alkyl esters, with C4-20 alcs.

25232-42-2, Polyvinylimidazole 33454-82-9, Lithium triflate
37296-91-6, Lithium molybdenum oxide 37349-20-5, Lithium tungsten oxide 39302-37-9, Lithium titanium oxide 473540-08-8
RL: DEV (Device component use); USES (Uses)
(continuous prodn. of trilaminates by coextrusion for polymer lithium batteries)
IT 7631-86-9, Silica, uses 9011-17-0, Kynar 2801
RL: MOA (Modifier or additive use); USES (Uses)
(continuous prodn. of trilaminates by coextrusion for polymer lithium batteries)
IT 25038-32-8
RL: DEV (Device component use); USES (Uses)
(isoprene-styrene rubber, continuous prodn. of trilaminates by coextrusion for polymer lithium batteries)
IT 7440-44-0, Carbon, uses
RL: DEV (Device component use); USES (Uses)
(mesocarbon microbeads; continuous prodn. of trilaminates by coextrusion for polymer lithium batteries)
RE.CNT 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Anon; DE 10020031 A1 HCAPLUS

L35 ANSWER 16 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 2
AN 2002:719538 HCAPLUS
DN 138:58831
ED Entered STN: 23 Sep 2002
TI Morphology/Behavior Relationship in Reversible Electrochemical Lithium Insertion into Graphitic Materials
AU Aurbach, Doron; Teller, Hanan; Levi, Elena
CS Department of Chemistry, Bar-Ilan University, Ramat-Gan, 52900, Israel
SO Journal of the Electrochemical Society (2002), 149(10), A1255-A1266
CODEN: JESOAN; ISSN: 0013-4651
PB Electrochemical Society
DT Journal
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 66, 72
AB Different types of **graphite** particles, including **synthetic** flakes, natural **graphite** flakes, **spherical graphite** particles (mesocarbon microbeads), and combinations of graphite flakes and disordered C particles were studied as **electrode** materials in Li insertion/deinsertion processes. The morphol. of the graphite particles plays an important role in their stability. One of the key factors is the structure of the facets perpendicular to the basal planes, through which Li insertion takes place. The smoother these facets are, and the less crevices they contain, the more stable are the graphite particles in Li insertion reactions. This is attributed to the fact that the surface reactions on the cathodically polarized graphite **electrodes** in the nonaq. Li salt solns. involve gas formation, which may have a detrimental effect on the integrity of the graphite particles. Another important factor is the existence of some degree of disorder and distortion in the graphite structure. More distortion in the ordered graphite structure may lead to higher stability. The detrimental effect of propylene carbonate in ethylene carbonate-based solns. may lead to an explanation of the factors that det. stability or destruction of lithiated graphite **electrodes**. The correlation between the morphol. of the graphite particles and their orientation in practical **electrodes** is also discussed. Chronopotentiometry, electron

microscopy, and x-ray diffraction were used in this study.
ST graphite **electrode** morphol failure lithium electrochem insertion; battery graphite anode morphol failure lithium electrochem insertion
IT Intercalation
(electrochem.; morphol./behavior relationship in reversible electrochem. lithium intercalation into graphitic anode materials for batteries)
IT Battery anodes
(morphol./behavior relationship in reversible electrochem. lithium intercalation into graphitic anode materials for batteries)
IT Intercalation
(retro, electrochem.; morphol./behavior relationship in reversible electrochem. lithium intercalation into graphitic anode materials for batteries)
IT 7782-42-5, Graphite, uses
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(BSP 20, NG 15 and UF 8, synthetic and natural flakes, anodes; morphol./behavior relationship in reversible electrochem. lithium intercalation into graphitic anode materials for batteries)
IT 7440-44-0, Carbon, uses
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(anodes; morphol./behavior relationship in reversible electrochem. lithium intercalation into graphitic anode materials for batteries)
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(electrolyte contg.; morphol./behavior relationship in reversible electrochem. lithium intercalation into graphitic anode materials for batteries with)
IT 7791-03-9, Lithium perchlorate (LiClO4) 21324-40-3, Lithium hexafluorophosphate (LiPF6)
RL: DEV (Device component use); USES (Uses)
(electrolyte; morphol./behavior relationship in reversible electrochem. lithium intercalation into graphitic anode materials for batteries with)
IT 7439-93-2, Lithium, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(morphol./behavior relationship in reversible electrochem. lithium intercalation into graphitic anode materials for batteries)
RE.CNT 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
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(2) Aurbach, D; Electrochim Acta 1999, V45, P67 HCAPLUS
(3) Aurbach, D; J Electrochem Soc 1996, V143, P3809 HCAPLUS
(4) Aurbach, D; J Electrochem Soc 1996, V143, PL273
(5) Aurbach, D; J Electrochem Soc 2001, V148, PA525
(6) Aurbach, D; J Phys Chem B 1997, V101, P2195 HCAPLUS
(7) Aurbach, D; J Power Sources 1993, V43, P47
(8) Aurbach, D; J Power Sources 1999, V81-82, P95 HCAPLUS
(9) Aurbach, D; Nonaqueous Electrochemistry, Chap 4 1999
(10) Dahn, C; J Power Sources 2001, V101, P96
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(16) Joint Committee Of Powder Diffraction Standards; JCPDS ICDD, File no 75-2078
(17) Lampe-Onnerud, C; J Power Sources 2001, V97-98, P133 HCAPLUS
(18) Naji, A; Carbon 1998, V36, P1347 HCAPLUS
(19) Noel, M; J Power Sources 1998, V72, P53 HCAPLUS
(20) Ohta, A; J Power Sources 1995, V54, P6 HCAPLUS
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(26) Winter, M; Adv Mater 1998, V10, P725 HCAPLUS
(27) Winter, M; Handbook of Battery Materials, Part III, Chap 5 1999
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(30) Xing, W; J Electrochem Soc 1996, V143, P3482 HCAPLUS
(31) Xue, J; J Electrochem Soc 1995, V142, P3668 HCAPLUS
(32) Yang, C; J Power Sources 1998, V72, P66 HCAPLUS
(33) Zaghib, K; J Power Sources 2001, V97-98, P97 HCAPLUS
(34) Zanem, D; J Power Sources 2001, V97-98, P146
(35) Zheng, T; Synth Met 1995, V73, P1 HCAPLUS

L35 ANSWER 17 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:279785 HCAPLUS
DN 136:372201
ED Entered STN: 15 Apr 2002
TI Electrochemical properties of MCMBs as anode for lithium ion battery
AU Li, Baohua; Guo, Ruixia; Li, Kaixi; Lu, Chunxiang; Ling, Licheng
CS State Key Laboratory of Coal Conversion, Institute of Coal Chemistry, Chinese Academy of Sciences, Taiyuan, 030001, Peop. Rep. China
SO Preprints of Symposia - American Chemical Society, Division of Fuel Chemistry (2002), 47(1), 187-188
CODEN: PSADFZ; ISSN: 1521-4648
PB American Chemical Society, Division of Fuel Chemistry
DT Journal
LA English
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
AB **Mesophase** microbeads (MCMBs) prepd. from petroleum **pitch** or coal tar is one of the candidate carbon materials for the **electrodes** used to further increase the energy d. of lithium secondary batteries. In this regard, the charge and discharge properties of MCMBs with different mean diam. and size distribution were examd. The MCMBs heat-treated at 973 K were found to have a higher reversible capacity than the theor. lithium storage capacity of a **graphite** anode, suggesting that there is a cavity mechanism for the charge-discharge reaction. The mean diam. and size distribution of MCMBs were found to have an influence on the charge-discharge properties of MCMBs.
ST mesocarbon microbead anode lithium ion battery
IT Battery anodes
(electrochem. properties of mesocarbon microbeads as anode for lithium-ion batteries)
IT 7440-44-0, Carbon, uses
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(electrochem. properties of mesocarbon microbeads as anode for

lithium-ion batteries)
RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
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(3) Ishikawa, M; Journal of Power Sources 1996, V62, P229
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(6) Naji, A; Carbon 1995, V33(9), P1347
(7) Pled, E; J Electrochem Soc 1996, V143(1), PL4

L35 ANSWER 18 OF 53 INSPEC (C) 2005 IEE on STN
AN 2002:7407826 INSPEC DN A2002-22-8245-018
TI Morphology/behavior relationship in reversible electrochemical lithium insertion into graphitic materials.
AU Aurbach, D.; Teller, H.; Levi, E. (Dept. of Chem., Bar-Ilan Univ., Ramat-Gan, Israel)
SO Journal of the Electrochemical Society (Oct. 2002) vol.149, no.10, p.A1255-66. 35 refs.
Doc. No.: S0013-4651(02)00110-6
Published by: Electrochem. Soc
Price: CCCC 0013-4651/2002/149(10)/1255/12/$7.00
CODEN: JESOAN ISSN: 0013-4651
SICI: 0013-4651(200210)149:10L.a1255:MBRR;1-P
DT Journal
TC Experimental
CY United States
LA English
AB Different types of **graphite** particles, including **synthetic** flakes, natural **graphite** flakes, **graphite** fibers, **round**-shaped **graphite** particles (mesocarbon microbeads), and combinations of graphite flakes and disordered carbon particles were studied as **electrode** materials in lithium insertion/deinsertion processes. We suggest that the morphology of the graphite particles plays an important role in their stability. One of the key factors is the structure of the facets, perpendicular to the basal planes, through which Li insertion takes place. The smoother these facets are, and which contain fewer crevices, the more stable are the graphite particles in Li insertion reactions. This is attributed to the fact that the surface reactions of the cathodically polarized graphite **electrodes** in the nonaqueous Li salt solutions involve gas formation, which may have a detrimental effect on the integrity of the graphite particles. Another important factor is the existence of some degree of disorder and distortion in the graphite structure. More distortion in the ordered graphite structure may lead to higher stability. A clue to the understanding of the factors that determine stability or destruction of lithiated graphite **electrodes** is the pronounced detrimental effect of the presence of propylene carbonate in ethylene carbonate-based solutions, as discussed herein. Another important factor dealt with in this paper is the correlation between the morphology of the graphite particles and their orientation in practical **electrodes**. The major tools for this study included chronopotentiometry, electron microscopy, and X-ray diffraction.
CC A8245 Electrochemistry and electrophoresis; A6865 Low-dimensional structures: growth, structure and nonelectronic properties
CT ELECTROCHEMICAL **ELECTRODES**; ELECTRON MICROSCOPY; GRAPHITE INTERCALATION COMPOUNDS; LITHIUM; X-RAY DIFFRACTION
ST morphology; reversible electrochemical lithium insertion; graphitic material; graphite particles; synthetic flakes; natural graphite flakes; graphite fibers; mesocarbon microbeads; disordered carbon

particles; **electrode material**; stability; facet structure; surface reaction; cathodic polarization; nonaqueous Li salt solution; disorder; gas formation; distortion; graphite structure; propylene carbonate; ethylene carbonate; particle orientation; chronopotentiometry; electron microscopy; X-ray diffraction; C-Li

CHI CLi bin, Li bin, C bin

ET Li; C*Li; C-Li; CLi; C cp; cp; Li cp

L35 ANSWER 19 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2001:655019 HCAPLUS

DN 135:229339

ED Entered STN: 07 Sep 2001

TI Nonaqueous electrolyte secondary batteries with uniform discharging end voltage

IN Tatebayashi, Yoshinao; Igasaki, Yoshiyuki; Kanda, Motoshi

PA Toshiba Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M004-02
ICS H01M004-02; H01M004-58; H01M010-40

CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2001243943	A2	20010907	JP 2000-54589	20000229
JP 3705728	B2	20051012		

PRAI JP 2000-54589 20000229

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 2001243943	ICM	H01M004-02
	ICS	H01M004-02; H01M004-58; H01M010-40
	IPCI	H01M0004-02 [ICM,7]; H01M0004-02 [ICS,7]; H01M0004-58 [ICS,7]; H01M0010-40 [ICS,7]

AB The batteries comprise (A) cathode active material mixts. contg. Li Ni mixed oxides and spinel-type Li Mn oxides and (B) carbonaceous anode active material mixts. contg. nongraphitic carbon materials and graphite. The blending ratio of the nongraphitic carbon and graphite is controlled to keep the discharge potential change rate (at the anode operating potential) to ≤20 mV/(m-Ah/g). The batteries are esp. suitable for their use under serial connection.

ST nonaq electrolyte secondary battery carbonaceous anode; nongraphitic carbon graphite blend battery anode; lithium mixed oxide cathode secondary battery; nickel lithium oxide cathode secondary battery; manganese lithium oxide cathode secondary battery

IT Carbon fibers, uses
RL: DEV (Device component use); USES (Uses)
(**graphite, mesophase pitch**-based, anodes; nonaq. secondary lithium batteries with lithium mixed oxide blended **cathodes** and nongraphitic carbon-**graphite** blended anodes)

IT Secondary batteries
(lithium; nonaq. secondary lithium batteries with lithium mixed oxide blended cathodes and nongraphitic carbon-graphite blended anodes)

IT Battery anodes

(nonaq. secondary lithium batteries with lithium mixed oxide blended cathodes and nongraphitic carbon-graphite blended anodes)

IT 7782-42-5, Graphite, uses
RL: DEV (Device component use); USES (Uses)
(anode; nonaq. secondary lithium batteries with lithium mixed oxide blended cathodes and nongraphitic carbon-graphite blended anodes)

IT 172922-65-5, Lithium manganese oxide (Li1.06Mn1.94O4) 358751-60-7, Aluminum cobalt lithium nickel oxide (Al0.08Co0.21LiNi0.71O2)
RL: DEV (Device component use); USES (Uses)
(cathode; nonaq. secondary lithium batteries with lithium mixed oxide blended cathodes and nongraphitic carbon-graphite blended anodes)

IT 7440-44-0, Carbon, uses
RL: DEV (Device component use); USES (Uses)
(nongraphitic, anode; nonaq. secondary lithium batteries with lithium mixed oxide blended cathodes and nongraphitic carbon-graphite blended anodes)

L35 ANSWER 20 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2001:85650 HCAPLUS
DN 134:149864
ED Entered STN: 06 Feb 2001
TI Method for treatment of meso-phase pitch to produce carbonaceous material for graphite used in battery **electrode**
IN Hatano, Hitomi; Nagayama, Katsuhiro; Eguchi, Kunihiko; Fukuda, Tsuneyoshi; Yutani, Satoshi
PA Kawasaki Steel Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C10C003-02
ICS C01B031-00; C01B031-02; C01B031-04; C10C003-08; H01M004-04
CC **51-19** (Fossil Fuels, Derivatives, and Related Products)
Section cross-reference(s): 52, 57

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2001031976	A2	20010206	JP 1999-208371	19990723

PRAI JP 1999-208371 19990723

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 2001031976	ICM	C10C003-02
	ICS	C01B031-00; C01B031-02; C01B031-04; C10C003-08; H01M004-04
	IPCI	C10C0003-02 [ICM,7]; C01B0031-00 [ICS,7]; C01B0031-02 [ICS,7]; C01B0031-04 [ICS,7]; C10C0003-08 [ICS,7]; H01M0004-04 [ICS,7]

AB The method is carried out by extn. and removal of light components (e.g., pyridine) from pitch contg. meso-phase phase (obtained from polymn. of condensed polycyclic arom. hydrocarbon in the presence of catalyst) using cyclic compd. and/or polycyclic arom. hydrocarbon. The treated meso-phase phase pitch is further under thermal treatment at 450° for 3 h to obtain carbonaceous material suitable for manufg. graphite as electrode material in Li secondary battery.

ST carbonaceous material **graphite** hydrocarbon

mesophase pitch; battery **electrode**
graphite pitch treatment

IT Polycyclic compounds
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(arom. hydrocarbons; method for treatment of meso-phase pitch to produce carbonaceous material for graphite used in battery electrode)

IT Battery electrodes
Graphitization
Mesophase pitch
Polymerization catalysts
Secondary batteries
(method for treatment of meso-phase **pitch** to produce carbonaceous material for **graphite** used in battery **electrode**)

IT Carbonaceous materials (technological products)
RL: FMU (Formation, unclassified); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process); USES (Uses)
(method for treatment of meso-phase pitch to produce carbonaceous material for graphite used in battery electrode)

IT Cyclic compounds
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(method for treatment of meso-phase pitch to produce carbonaceous material for graphite used in battery electrode)

IT Aromatic hydrocarbons, uses
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(polycyclic; method for treatment of meso-phase pitch to produce carbonaceous material for graphite used in battery electrode)

IT 7637-07-2, Boron fluoride (BF3), uses 7664-39-3, Hydrogen fluoride, uses
RL: CAT (Catalyst use); NUU (Other use, unclassified); USES (Uses)
(method for treatment of meso-phase pitch to produce carbonaceous material for graphite used in battery electrode)

IT 7782-42-5P, Graphite, uses
RL: DEV (Device component use); IMF (Industrial manufacture); NUU (Other use, unclassified); PREP (Preparation); USES (Uses)
(method for treatment of meso-phase pitch to produce carbonaceous material for graphite used in battery electrode)

IT 91-20-3, Naphthalene, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(method for treatment of meso-phase pitch to produce carbonaceous material for graphite used in battery electrode)

IT 110-86-1, Pyridine, processes
RL: PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(method for treatment of meso-phase pitch to produce carbonaceous material for graphite used in battery electrode)

L35 ANSWER 21 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2001:152411 HCAPLUS
DN 134:181116
ED Entered STN: 02 Mar 2001
TI Flat nonaqueous electrolyte secondary battery with improvements in heavy loading discharge characteristics
IN Suzuki, Masami; Hayami, Muneto; Udagawa, Kazuo; Iiduka, Kazuo; Ishihara, Naomi; Hirahara, Satoshi; Sakai, Hirotaka; Yoda, Kiyoto; Shikota, Masataka
PA Toshiba Battery Co., Ltd., Japan

SO Eur. Pat. Appl., 51 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H01M010-40
ICS H01M002-02; H01M010-04
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 55

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI EP 1079454	A2	20010228	EP 2000-117368	200008 23
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2001068160	A2	20010316	JP 1999-240964	199908 27
JP 2001068143	A2	20010316	JP 1999-241290	199908 27
JP 2001143763	A2	20010525	JP 1999-327679	199911 18
JP 2002008729	A2	20020111	JP 2000-183000	200006 19
JP 2002008727	A2	20020111	JP 2000-183001	200006 19
TW 504854	B	20021001	TW 2000-89116426	200008 15
US 6521373	B1	20030218	US 2000-641267	200008 17
HK 1035605	A1	20050916	HK 2001-106014	200108 27
US 2003138693	A1	20030724	US 2002-318177	200212 13
US 2005271938	A1	20051208	US 2005-176400	200507 08

PRAI JP 1999-240964	A	19990827	
JP 1999-241290	A	19990827	
JP 1999-327679	A	19991118	
JP 2000-183000	A	20000619	
JP 2000-183001	A	20000619	
US 2000-641267	A3	20000817	
US 2002-318177	A3	20021213	

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 1079454	ICM	H01M010-40
	ICS	H01M002-02; H01M010-04
	IPCI	H01M0010-40 [ICM,6]; H01M0002-02 [ICS,6]; H01M0010-04 [ICS,6]
	ECLA	H01M002/02B6B2; H01M002/02E2C; H01M002/12D2;

		H01M010/04C2; H01M010/40L2
JP 2001068160	IPCI	H01M0010-40 [ICM,7]
JP 2001068143	IPCI	H01M0010-04 [ICM,7]; H01M0004-02 [ICS,7]; H01M0004-58 [ICS,7]; H01M0010-40 [ICS,7]
JP 2001143763	IPCI	H01M0010-40 [ICM,7]; H01M0002-04 [ICS,7]; H01M0002-08 [ICS,7]; H01M0004-02 [ICS,7]
JP 2002008729	IPCI	H01M0010-40 [ICM,7]; H01M0004-64 [ICS,7]; H01M0004-74 [ICS,7]
JP 2002008727	IPCI	H01M0010-40 [ICM,7]
TW 504854	IPCI	H01M0006-14 [ICM,7]; H01M0010-38 [ICS,7]; H01M0002-00 [ICS,7]
US 6521373	IPCI	H01M0006-46 [ICM,7]
	NCL	429/162.000; 429/094.000; 429/124.000; 429/127.000
	ECLA	H01M002/02B6B2; H01M002/02E2C; H01M002/12D2; H01M010/04C2; H01M010/40L2
HK 1035605	IPCI	H01M [ICM,7]
US 2003138693	IPCI	H01M0002-02 [ICM,7]; H01M0002-08 [ICS,7]; H01M0004-58 [ICS,7]; H01M0010-40 [ICS,7]; H01M0004-66 [ICS,7]
	NCL	429/162.000
	ECLA	H01M002/02B6B2; H01M002/02E2C; H01M002/12D2; H01M010/04C2; H01M010/40L2
US 2005271938	IPCI	H01M0002-08 [ICM,7]; H01M0010-04 [ICS,7]; H01M0004-58 [ICS,7]; H01M0010-40 [ICS,7]; H01M0002-04 [ICS,7]; H01M0002-02 [ICS,7]
	NCL	429/185.000; 429/128.000; 429/162.000; 429/231.800; 429/329.000; 429/330.000; 429/176.000; 429/175.000

AB In a flat nonaq. electrolyte secondary cell comprising an electricity-generating element including at least a **cathode**, a separator and an anode and a nonaq. electrolyte in the inside of a **cathode** case, a plurality of **electrode** units each consisting of the **cathode** and the anode opposite to each another via the separator are laminated to form an **electrode** group, or an **electrode** unit in a sheet form consisting of the **cathode** and the anode opposite to each another via the separator is wound to form an **electrode** group, or a sheet-shape **cathode** is wrapped with the separator except for a part contacting at inner face of **cathode** case and a sheet-shaped anode is set on the sheet-shaped **cathode** in a right angled position each other and then these **cathode** and anode are bent alternately to form an **electrode** group, and the total sum of the areas of the opposing **cathode** and anode in this **electrode** group is larger than the area of the opening of an insulating gasket in a sealed portion in the **cathode** case or than the area of an opening in a sealed plate in a sealed portion in the **cathode** case, whereby the discharge capacity upon heavy-loading discharge is significantly increased as compared with the conventional cells. Accordingly, while the size of the cell is small, the discharge capacity is increased as described above, and thus it is possible to provide a highly utilizable flat nonaq. electrolyte secondary cell. Further, in the flat nonaq. electrolyte secondary cell, problems which may be caused by the increased discharge capacity in the cell can be solved by improving the solvent and supporting electrolyte for the electrolyte or by various improvements in the **cathode** and anode cases.

ST nonaq electrolyte secondary battery flat

IT Battery electrolytes
Secondary batteries
(flat nonaq. electrolyte secondary battery with improvements in

heavy loading discharge characteristics)

IT Carbonaceous materials (technological products)
RL: DEV (Device component use); USES (Uses)
(flat nonaq. electrolyte secondary battery with improvements in heavy loading discharge characteristics)

IT Carbon black, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(flat nonaq. electrolyte secondary battery with improvements in heavy loading discharge characteristics)

IT Fluoropolymers, uses
Styrene-butadiene rubber, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(flat nonaq. electrolyte secondary battery with improvements in heavy loading discharge characteristics)

IT Carbon fibers, uses
RL: DEV (Device component use); USES (Uses)
(**mesophase pitch**, graphitized; flat nonaq. electrolyte secondary battery with improvements in heavy loading discharge characteristics)

IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(tape; flat nonaq. electrolyte secondary battery with improvements in heavy loading discharge characteristics)

IT 96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate 9002-88-4, Polyethylene 12190-79-3, Cobalt lithium oxide colio2 12597-68-1, Stainless steel, uses 14283-07-9 21324-40-3, Lithium hexafluorophosphate 326594-36-9 326594-37-0 326594-38-1 326594-39-2 326594-40-5 326594-41-6
RL: DEV (Device component use); USES (Uses)
(flat nonaq. electrolyte secondary battery with improvements in heavy loading discharge characteristics)

IT **7782-42-5**, **Graphite**, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(flat nonaq. electrolyte secondary battery with improvements in heavy loading discharge characteristics)

IT 7440-02-0, Nickel, uses **7440-50-8**, **Copper**, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(flat nonaq. electrolyte secondary battery with improvements in heavy loading discharge characteristics)

IT 872-50-4, n-Methylpyrrolidone, uses 9000-11-7, Cmc 24937-79-9, Pvdf
RL: TEM (Technical or engineered material use); USES (Uses)
(flat nonaq. electrolyte secondary battery with improvements in heavy loading discharge characteristics)

IT 7429-90-5, Aluminum, uses 7440-03-1, Niobium, uses 7440-32-6, Titanium, uses
RL: MOA (Modifier or additive use); USES (Uses)
(stainless steel contg.; flat nonaq. electrolyte secondary battery with improvements in heavy loading discharge characteristics)

IT 9003-55-8
RL: TEM (Technical or engineered material use); USES (Uses)
(styrene-butadiene rubber, flat nonaq. electrolyte secondary battery with improvements in heavy loading discharge characteristics)

IT 9002-84-0, Ptfe
RL: TEM (Technical or engineered material use); USES (Uses)
(tape; flat nonaq. electrolyte secondary battery with improvements in heavy loading discharge characteristics)

L35 ANSWER 22 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2001:627403 HCAPLUS
DN 135:307430
ED Entered STN: 30 Aug 2001
TI Mesophase coal tar pitch as an intermediate stage in production of **electrode** coke
AU Robak, Zbigniew; Kubica, Krystyna
CS Inst. Chem. Przerobki Wegla, Zabrze, Pol.
SO Zeszyty Naukowe Politechniki Slaskiej, Chemia (2001), 142, 173-180
CODEN: ZNSCAM; ISSN: 0372-9494
PB Wydawnictwo Politechniki Slaskiej
DT Journal
LA Polish
CC **57-8** (Ceramics)
Section cross-reference(s): 51
AB **Electrode** cokes is routinely produced by delayed coking of carefully chosen petroleum- or coal tar-derived feedstocks. The process has its advantages and disadvantages, and to avoid some of its difficulties other ways of transforming liq. **pitches** into hard cokes are still under investigation. We tried to obtain a highly anisotropic coke, with good graphitizability, by chamber coking of a **mesophase pitch.** This material was obtained from the model plant for continuous thermal treatment of light tar **pitches**, and typically contained .apprx.50% **mesophase. Mesophase pitch** was carbonized in the semi-tech. chamber coking plant at 550°C. The obtained coke was investigated for its suitability for the **electrode** industry. The procedure simulates the typical manufg. process for **graphite electrodes**, using as a feedstock the "**mesophase** coke" and a std. petroleum coke. It appeared that the "**mesophase** coke" gave graphitized product showing properties comparable with that obtained from com. Texas petroleum coke.
ST mesophase coal tar pitch feedstock electrode coke manuf
IT **Mesophase pitch**
(coal tar **pitch**, precursor; processing of **mesophase** coal tar **pitch** as feedstock for prepn. of coke for **graphite electrode** manuf.)
IT Coke
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PRP (Properties); PREP (Preparation); PROC (Process)
(**electrode**; processing of **mesophase** coal tar **pitch** as feedstock for prepn. of coke for **graphite electrode** manuf.)
IT Coal tar **pitch**
(**mesophase**, precursor; processing of **mesophase** coal tar **pitch** as feedstock for prepn. of coke for **graphite electrode** manuf.)
IT **7782-42-5, Graphite**, miscellaneous
RL: MSC (Miscellaneous)
(**electrodes**; processing of **mesophase** coal tar **pitch** as feedstock for prepn. of coke for **graphite electrode** manuf.)

L35 ANSWER 23 OF 53 INSPEC (C) 2005 IEE on STN
AN 2003:7508108 INSPEC DN A2003-04-8630F-034; B2003-02-8410E-053
TI Development of new anodes for rechargeable lithium batteries.
AU Sandi, G. (Div. of Chem., Argonne Nat. Lab., IL, USA)
SO New Materials for Electrochemical Systems IV.. Extended Abstracts of the Fourth International Symposium on New Materials for

Electrochemical Systems
Editor(s): Savadogo, O.
Montreal, Que., Canada: Ecole Polytechnique de Montreal, 2001. p.162 of xxiii+488 pp.
Conference: Montreal, Que., Canada, 9-13 July 2001
DT Conference Article
TC Practical
CY Canada
LA English
AB Summary form only given. Lithium ion secondary batteries are currently the best portable energy storage device for the consumer electronics market. The development of the lithium ion secondary batteries has been achieved by the use of selected carbon and **graphite** materials as an anode. The performance of lithium ion secondary batteries, such as the charge/discharge capacity, voltage profile and cyclic stability, depend strongly on the microstructure of the anode materials made of carbon and **graphite**. Due to the contribution of the carbon materials used in the anode in the last five years, the capacity of the typical Li ion battery has been improved 1.7 times. However, there are still active investigations to identify the key parameters of carbons that provide the improved anode properties, as carbon and **graphite** materials have large varieties in the microstructure, texture, crystallinity and morphology, depending on their preparation processes and precursor materials, as well as various forms such as powder, fibers and spherule. There is a strong correlation between the microstructural parameters and electrochemical properties of conventional and novel types of carbon materials for Li ion batteries, namely, graphitizable carbons such as milled **mesophase pitch**-based carbon fibers, polyparaphenylene based carbon heat-treated at low temperatures, boron doped graphitized materials, and templated carbons. a variety of tin oxide based compounds; SnO, SnO3, LiSnO3, and SnSiO3 glass, have been tested as anode materials. These materials demonstrate discharge capacities on the order of 1000 mAh/(g Sn), which is consistent with the alloying capacity limit of 4.4 Li atoms per Sn atom, or 991 mAh/(g Sn). However, the irreversible capacities ranged from 200 mAh/(g active) to 700 mAh/(g active). By introducing lithium, lithium oxide and tin form first, which is then followed by the formation of the various LiSn alloy phases. Other investigations have focused on the **copper**-tin system at around the composition Cu6Sn5 and have determined the effect on cycling and capacity of **electrodes** with various ratios of **copper** to tin. Other systems are compared and discussed in detail. The basic scientific theory can contribute to further developments of the Li ion batteries such as polymer batteries for consumer electronics, multimedia technology and future hybrid and electric vehicles.
CC A8630F Secondary cells; A8245 Electrochemistry and electrophoresis; B8410E Secondary cells
CT ANODES; CARBON; CARBON FIBRES; ELECTROCHEMICAL **ELECTRODES**; **GRAPHITE**; LITHIUM; SECONDARY CELLS
ST anodes; rechargeable lithium batteries; lithium ion secondary batteries; portable energy storage device; consumer electronics; **graphite materials**; carbon; anode; charge/discharge capacity; voltage profile; cyclic stability; microstructure; Li ion battery; texture; crystallinity; morphology; preparation processes; precursor materials; powder; fibers; spherule; microstructural parameters; electrochemical properties; Li ion batteries; graphitizable carbons; **milled mesophase pitch-based carbon fibers**; polyparaphenylene based carbon; boron doped graphitized materials; tin oxide based compounds; SnO; SnO3; LiSnO3; SnSiO3

glass; irreversible capacities; **copper-tin system**; Cu6Sn5; templated carbons; Li
CHI Li int, Li el
ET Li; O*Sn; SnO; Sn cp; cp; O cp; SnO3; Li*O*Sn; Li sy 3; sy 3; O sy 3; Sn sy 3; LiSnO3; Li cp; O*Si*Sn; Si sy 3; SnSiO3; Si cp; Sn; Li*Sn; Li sy 2; sy 2; Sn sy 2; LiSn; Cu*Sn; Cu sy 2; Cu6Sn5; Cu cp

L35 ANSWER 24 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:143858 HCAPLUS
DN 136:153932
ED Entered STN: 25 Feb 2002
TI Method for manufacturing cathode active material for lithium secondary battery
IN Kim, Gwang Sik; Noh, Yeong Bae; Ryu, Jae Yul; Park, Jeong Jun; Woo, Il Gi; Yoon, Sang Yeong
PA Samsung Sdi Co., Ltd., S. Korea
SO Repub. Korean Kongkae Taeho Kongbo, No pp. given
CODEN: KRXXA7
DT Patent
LA Korean
IC ICM H01M004-48
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI KR 2000037532	A	20000705	KR 1998-52140	199812 01

PRAI KR 1998-52140 19981201

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
KR 2000037532	ICM	H01M004-48
	IPCI	H01M0004-48 [ICM,7]

AB A **cathode** active material for a lithium secondary battery is provided to enhance the charging and discharging characteristics and cycle life by manufg. the **cathode** active material by mixing a natural **black lead** with a synthetic **black lead.** A **cathode** active material for a lithium secondary battery is manufd. by mixing a natural **black lead** with a synthetic **black lead.** By mixing the natural **black lead** with the synthetic **black lead**, the difference of the elec. cond. between a-axis and c-axis is reduced by providing a conductive passage. The synthetic **black lead** is a milled carbon fiber made of a **mesophase pitch.**
ST cathode active material lithium secondary battery
IT Secondary batteries
(lithium; method for manufg. cathode active material for lithium secondary battery)
IT Battery cathodes
Mesophase pitch
(method for manufg. cathode active material for lithium secondary battery)
IT Carbon fibers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(method for manufg. cathode active material for lithium secondary battery)
IT 7439-92-1, Lead, uses
RL: DEV (Device component use); USES (Uses)

(black, natural and synthetic; method for manufg. cathode active material for lithium secondary battery)

L35 ANSWER 25 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:53110 HCAPLUS
DN 132:110583
ED Entered STN: 23 Jan 2000
TI Secondary lithium batteries using cathodes containing mixed oxides
IN Ikasaki, Yoshiyuki; Sakurai, Katsuyuki; Hasebe, Hiroyuki
PA Toshiba Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 18 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-62
ICS H01M004-02; H01M004-58; H01M010-40
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2000021407	A2	20000121	JP 1998-184443	19980630
JP 2971451	B2	19991108		
PRAI JP 1998-184443		19980630		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 2000021407	ICM	H01M004-62
	ICS	H01M004-02; H01M004-58; H01M010-40
	IPCI	H01M0004-62 [ICM,6]; H01M0004-02 [ICS,6]; H01M0004-58 [ICS,6]; H01M0010-40 [ICS,6]

AB The batteries have cathodes contg. $LiNi_{1-x}M_xO_2$ (M = element; $0 < x \leq 0.5$), elec. conductors contg. carbonaceous materials (A) and (B) having av. sizes ≤100 nm and ≥1 μm, resp., and binders contg. acrylic rubber copolymers and ≤45 wt.% (based on binders) vinylidene fluoride-type fluoropolymers, anodes, and nonaq. electrolyte solns. The batteries have long cycle life.

ST battery cathode lithium oxide acrylic binder; carbon fluoropolymer lithium oxide battery cathode

IT Synthetic rubber, uses
RL: DEV (Device component use); USES (Uses)
(acrylic acid-butadiene-itaconic acid-Me methacrylate-styrene; secondary Li batteries using cathodes contg. mixed oxides, C, and polymer binders for long cycle life)

IT Synthetic rubber, uses
RL: DEV (Device component use); USES (Uses)
(acrylonitrile-butadiene-fumaric acid-itaconic acid-Me methacrylate-styrene; secondary Li batteries using cathodes contg. mixed oxides, C, and polymer binders for long cycle life)

IT Synthetic rubber, uses
RL: DEV (Device component use); USES (Uses)
(acrylonitrile-butadiene-itaconic acid-Me methacrylate-styrene; secondary Li batteries using cathodes contg. mixed oxides, C, and polymer binders for long cycle life)

IT Carbon fibers, uses
RL: DEV (Device component use); USES (Uses)
(**graphite, mesophase pitch**-based, anodes; secondary Li batteries using **cathodes** contg. mixed oxides, C, and polymer binders for long cycle life)

IT Secondary batteries
(lithium; secondary Li batteries using cathodes contg. mixed oxides, C, and polymer binders for long cycle life)
IT Battery anodes
Battery cathodes
Battery electrolytes
(secondary Li batteries using cathodes contg. mixed oxides, C, and polymer binders for long cycle life)
IT Carbon black, uses
Carbonaceous materials (technological products)
Fluoropolymers, uses
Oxides (inorganic), uses
RL: DEV (Device component use); USES (Uses)
(secondary Li batteries using cathodes contg. mixed oxides, C, and polymer binders for long cycle life)
IT 75-05-8, Acetonitrile, uses 96-48-0, γ-Butyrolactone
96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate
623-53-0, Methyl ethyl carbonate 73506-93-1, Diethoxyethane
RL: DEV (Device component use); USES (Uses)
(electrolyte soln.; secondary Li batteries using cathodes contg. mixed oxides, C, and polymer binders for long cycle life)
IT 21324-40-3, Lithium hexafluorophosphate
RL: DEV (Device component use); USES (Uses)
(electrolyte; secondary Li batteries using cathodes contg. mixed oxides, C, and polymer binders for long cycle life)
IT 70857-13-5, Acrylonitrile-butadiene-itaconic acid-methyl methacrylate-styrene copolymer 70857-14-6, Acrylic acid-butadiene-itaconic acid-methyl methacrylate-styrene copolymer
118295-24-2, Acrylonitrile-butadiene-fumaric acid-itaconic acid-methyl methacrylate-styrene copolymer
RL: DEV (Device component use); USES (Uses)
(rubber; secondary Li batteries using cathodes contg. mixed oxides, C, and polymer binders for long cycle life)
IT 75-38-7D, Vinylidene fluoride, carboxy derivs., polymers
7782-42-5, Graphite, uses 24937-79-9, Poly(vinylidene fluoride)
RL: DEV (Device component use); USES (Uses)
(secondary Li batteries using cathodes contg. mixed oxides, C, and polymer binders for long cycle life)
IT 113066-89-0P, Cobalt lithium nickel oxide (Co0.2LiNi0.8O2)
255063-53-7P, Aluminum cobalt lithium nickel oxide (Al0.03Co0.17LiNi0.8O2) 255063-55-9P, Cobalt lithium nickel borate oxide (Co0.17LiNi0.8(BO3)0.03O1.91)
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(secondary Li batteries using cathodes contg. mixed oxides, C, and polymer binders for long cycle life)

L35 ANSWER 26 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:723263 HCAPLUS
DN 133:269460
ED Entered STN: 13 Oct 2000
TI Lithium secondary battery
IN Sato, Asako; Kuboki, Takashi; Yamada, Shuji; Hasebe, Hiroyuki; Takami, Norio; Ohsaki, Takahisa; Kanda, Motoya
PA Kabushiki Kaisha Toshiba, Japan
SO Eur. Pat. Appl., 52 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H01M002-02
ICS H01M010-04

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1 PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI EP 1043782	A2	20001011	EP 2000-106079	200003 30
EP 1043782	A3	20011114		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
US 6589690	B1	20030708	US 2000-536685	200003 28
CN 1273439	A	20001115	CN 2000-118175	200003 30
CN 1133228	B	20031231		
JP 2000348776	A2	20001215	JP 2000-94680	200003 30
JP 3721044	B2	20051130		
TW 451511	B	20010821	TW 2000-89105965	200003 30
JP 2004047479	A2	20040212	JP 2003-285821	200308 04
PRAI JP 1999-89173	A	19990330		
JP 1999-89175	A	19990330		
JP 2000-94680	A3	20000330		

CLASS PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 1043782	ICM	H01M002-02
	ICS	H01M010-04
	IPCI	H01M0002-02 [ICM,6]; H01M0010-04 [ICS,6]
	ECLA	H01M002/02E2D; H01M010/04; H01M010/04F
US 6589690	IPCI	H01H0069-02 [ICM,7]; H01M0006-00 [ICS,7]; H01M0004-58 [ICS,7]
	NCL	429/162.000; 029/623.100; 029/623.300; 029/623.500; 429/160.000; 429/164.000; 429/231.800; 429/231.950
	ECLA	H01M002/02E2D; H01M010/04; H01M010/04F
CN 1273439	IPCI	H01M0010-40 [ICM,7]; H01M0010-36 [ICS,7]
JP 2000348776	IPCI	H01M0010-40 [ICM,7]; H01M0010-40 [ICS,7]; H01M0002-02 [ICS,7]; H01M0002-18 [ICS,7]; H01M0010-04 [ICS,7]; H01M0004-58 [ICS,7]
TW 451511	IPCI	H01M0010-40 [ICM,7]
JP 2004047479	IPCI	H01M0010-40 [ICM,7]; H01M0002-02 [ICS,7]; H01M0004-02 [ICS,7]; H01M0004-58 [ICS,7]
	FTERM	5H011/AA03; 5H011/AA13; 5H011/CC02; 5H011/CC06; 5H011/CC10; 5H011/DD01; 5H011/DD03; 5H011/DD13; 5H011/KK01; 5H029/AJ05; 5H029/AJ12; 5H029/AK02; 5H029/AK03; 5H029/AK05; 5H029/AL01; 5H029/AL02; 5H029/AL03; 5H029/AL04; 5H029/AL06; 5H029/AL07; 5H029/AL08; 5H029/AL12; 5H029/AM02; 5H029/AM03; 5H029/AM04; 5H029/AM05; 5H029/AM07; 5H029/AM16; 5H029/BJ04; 5H029/BJ14; 5H029/DJ02; 5H029/DJ04; 5H029/EJ04; 5H029/EJ12; 5H029/HJ04; 5H050/AA07; 5H050/AA15; 5H050/BA17; 5H050/CA02; 5H050/CA05; 5H050/CA07; 5H050/CA08; 5H050/CA09; 5H050/CA11;

5H050/CB01; 5H050/CB02; 5H050/CB03; 5H050/CB05;
5H050/CB07; 5H050/CB08; 5H050/CB09; 5H050/CB12;
5H050/DA04; 5H050/DA19; 5H050/EA09; 5H050/EA24;
5H050/FA05; 5H050/HA04

AB A secondary battery comprises an **electrode** group with a pos. **electrode**, a neg. **electrode** having a neg. **electrode** collector and a neg. **electrode** layer held to the collector, and a separator interposed between the pos. **electrode** and the neg. **electrode** layer, a nonaq. electrolyte held by the **electrode** group, and a jacket housing the **electrode** group and having a thickness of not more than 0.3 mm. The pos. **electrode**, the neg. **electrode** and the separator are formed integral, and the peeling strength between the neg. **electrode** layer and the separator is lower than the peeling strength between the neg. **electrode** layer and the neg. **electrode** collector.

ST lithium secondary battery

IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(binder; lithium secondary battery)

IT Battery anodes
Battery **cathodes**
(lithium secondary battery)

IT Carbon fibers, uses
RL: DEV (Device component use); USES (Uses)
(lithium secondary battery)

IT Carbon black, uses
RL: MOA (Modifier or additive use); USES (Uses)
(lithium secondary battery)

IT Secondary batteries
(lithium; lithium secondary battery)

IT Carbon fibers, uses
RL: DEV (Device component use); USES (Uses)
(**mesophase pitch**-based; lithium secondary battery)

IT Carbon fibers, uses
RL: DEV (Device component use); USES (Uses)
(**pitch**-based; lithium secondary battery)

IT Polyimides, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(resin; lithium secondary battery)

IT 25014-41-9, Polyacrylonitrile
RL: TEM (Technical or engineered material use); USES (Uses)
(adhesive; lithium secondary battery)

IT 24937-79-9, Pvdf
RL: TEM (Technical or engineered material use); USES (Uses)
(binder; lithium secondary battery)

IT 96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate
105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate
7429-90-5, Aluminum, uses **7440-50-8, Copper**,
uses 9002-88-4, Polyethylene 14283-07-9, Lithium
tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate
111706-40-2, Cobalt lithium oxide CoLi0-1O2 113066-89-0, Cobalt
lithium nickel oxide Co0.2LiNi0.8O2
RL: DEV (Device component use); USES (Uses)
(lithium secondary battery)

IT **7782-42-5, Graphite**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(lithium secondary battery)

IT 9003-07-0, Polypropylene
RL: TEM (Technical or engineered material use); USES (Uses)
(lithium secondary battery)

IT 7440-44-0, Carbon, uses
RL: DEV (Device component use); USES (Uses)
(spheres or granules; lithium secondary battery)

L35 ANSWER 27 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1999:465067 HCAPLUS
DN 131:288727
ED Entered STN: 29 Jul 1999
TI Characteristics of coke carbon modified with mesophase-pitch as a negative electrode for lithium ion batteries
AU Sato, Yuichi; Kikuchi, Yasuo; Nakano, Takeshi; Okuno, Gaku; Kobayakawa, Koichi; Kawai, Takanobu; Yokoyama, Akira
CS Faculty of Engineering, Department of Applied Chemistry, Kanagawa University, Kanagawa-ku, Yokohama, Japan
SO Journal of Power Sources (1999), 81-82, 182-186
CODEN: JPSODZ; ISSN: 0378-7753
PB Elsevier Science S.A.
DT Journal
LA English
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57, 72
AB To increase the charge-discharge capacity of carbon electrodes for lithium ion secondary batteries, coke carbon, a relatively cheap material, was modified with mesophase-pitch carbon by a heat treatment. While coke carbon powder, mesophase-pitch, and a mixt. thereof (4:1 by wt.) supplied between 0 and 1.5 V vs. Li/Li+ an initial discharge capacity of about 295 mA-h/g, 310 mA-h/g, and 310 mA-h/g, resp., the modified coke deintercalated 400 mA-h/g of lithium with a high degree of reversibility. The difference in capacity between the modified carbon and mixt. are discussed based on the shape of their current-potential curves and their galvanostatic charge-discharge curves.
ST lithium battery anode coke carbon
IT Battery anodes
Cyclic voltammetry
(characteristics of coke carbon modified with mesophase-pitch as a neg. electrode for lithium ion batteries)
IT Carbonaceous materials (technological products)
Coke
RL: DEV (Device component use); USES (Uses)
(characteristics of coke carbon modified with mesophase-pitch as a neg. electrode for lithium ion batteries)
IT Secondary batteries
(lithium; characteristics of coke carbon modified with mesophase-pitch as a neg. electrode for lithium ion batteries)
IT 7440-44-0, Carbon, uses **7782-42-5**, **Graphite**, uses
RL: DEV (Device component use); USES (Uses)
(characteristics of coke carbon modified with **mesophase -pitch** as a neg. **electrode** for lithium ion batteries)
RE.CNT 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Alamgir, M; J Electrochem Soc 1993, V141, PL143
(2) Bar-Tow, D; The Electrochemical Soc Meeting Abstracts 1996, V96-2, P1028
(3) Besenhard, J; J Power Sources 1995, V54, P228 HCAPLUS
(4) Disma, E; J Electrochem Soc 1996, V143, P3959
(5) Eli, Y; J Electrochem Soc 1997, V144, P2968
(6) Fong, R; J Electrochem Soc 1990, V137, P2009 HCAPLUS
(7) Hara, M; J Phys Chem 1995, V99, P16338 HCAPLUS

(8) Inagaki, M; Tanso (Carbon) 1984, V118, P165 HCAPLUS
(9) JSPS; Tanso 1963, V36, P25
(10) Kikuchi, M; J Electroanal Chem 1995, V396, P451 HCAPLUS
(11) Kinoshita, K; Carbon Electrochemical and Physicochemical Properties 1988
(12) Mabuchi, A; J Electrochem Soc 1995, V142, P1041 HCAPLUS
(13) Nakajima, T; Denki Kagaku 1996, V64, P922 HCAPLUS
(14) Ohsaki, T; Proceeding of the 34th Battery Symposium in Japan 1993, P79
(15) Omaru, A; The Electrochemical Soc Extended Abstracts 1992, V92-2, P34
(16) Sato, K; Science 1994, V264, P556 HCAPLUS
(17) Sonbe, N; Proceedings of the 35th Battery Symposium in Japan 1994, P47
(18) Takami, N; J Electrochem Soc 1995, V142, P371 HCAPLUS
(19) Tatsumi, K; J Electrochem Soc 1995, V142, P716 HCAPLUS
(20) Tuinstra, F; J Chem Phys 1970, V53, P1126 HCAPLUS
(21) Yata, S; Synth Met 1994, V62, P153 HCAPLUS

L35 ANSWER 28 OF 53 JAPIO (C) 2005 JPO on STN
AN 1998-121054 JAPIO
TI PRODUCTION OF NONSCALELIKE CARBONACEOUS POWDER AND GRAPHITE POWDER
IN SAKAI YUKIO; FUJIURA TAKATSUGU
PA MITSUBISHI GAS CHEM CO INC
PI JP 10121054 A 19980512 Heisei
AI JP 1996-278012 (JP08278012 Heisei) 19961021
PRAI JP 1996-278012 19961021
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1998
IC ICM C10C003-02
ICS C01B031-02; C01B031-04; C10C003-04; C10C003-10; H01M004-02; H01M004-04; H01M004-58
AB PROBLEM TO BE SOLVED: To obtain nearly **spherical** nonscalelike carbonaceous powder by heat-treating specified **synthetic mesophase** pitch in a specified temperature range in nonoxidizing atmosphere and grinding the treated pitch.
SOLUTION: This powder is obtained by heat-treating **mesophase** pitch obtained by polymerizing fused polycyclic hydrocarbon or a material containing it in a temperature region of 470-700°C in the presence of hydrogen fluoride or boron trifluoride in nonoxidizing atmosphere and grinding the treated pitch. The nonoxidizing gas used is exemplified by nitrogen or argon. The powder is graphitized at 1,900-3,000°C without undergoing fusion among particles to obtain nonscalelike higher crystalline **graphite** powder retaining the shape after the grinding. The **graphite** powder is desirable as a negative **electrode** material of a lithium ion battery and is very advantageous to improve **electrode** packing properties and to thereby attain a high energy density. Further, it has excellent conductivity and therefore it is usable also as a conductive filler for various materials.

L35 ANSWER 29 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1997:388601 HCAPLUS
DN 127:20944
ED Entered STN: 21 Jun 1997
TI Method for manufacture of carbonaceous material for nonaqueous lithium secondary batteries
IN Nishimura, Kasuke
PA Petoca, Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-58
ICS D01F009-145; H01M004-02; H01M004-04; D21H013-50
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 09092283	A2	19970404	JP 1995-263710	199509 19

PRAI JP 1995-263710 19950919

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 09092283	ICM	H01M004-58
	ICS	D01F009-145; H01M004-02; H01M004-04; D21H013-50
	IPCI	H01M0004-58 [ICM,6]; D01F0009-145 [ICS,6]; H01M0004-02 [ICS,6]; H01M0004-04 [ICS,6]; D21H0013-50 [ICS,6]

AB The carbonaceous material is paper sheets 50-200 μm thick having an apparent d. 1.0-1.5 g/cm3, prepd. from 5-30% C fibers 1-20 μm in length and 5-10% **mesophase pitch**-based micro C beads and/or powd. **graphite** (natural or synthetic), and is used for **cathodes** of nonaq. Li secondary batteries.

ST carbon fiber micro bead battery cathode

IT Battery cathodes
(carbon fibers and mesophase pitch-based beads for nonaq. lithium secondary batteries)

IT Carbon fibers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(carbon fibers and mesophase pitch-based beads for nonaq. lithium secondary batteries)

IT Secondary batteries
(lithium; carbon fibers and mesophase pitch-based beads for nonaq. lithium secondary batteries)

L35 ANSWER 30 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1997:723810 HCAPLUS
DN 128:24881
ED Entered STN: 17 Nov 1997
TI High-capacity lithium-ion cells using graphitized mesophase-pitch-based carbon fiber anodes
AU Ohsaki, Takahisa; Kanda, Motoya; Aoki, Yoshiyasu; Shiroki, Hiroyuki; Suzuki, Shintaro
CS Saiwai-ku, 72 Horikawa-cho, Toshiba Corporation, Materials and Devices Research Laboratories, R+D Center, Kawasaki 210, Japan
SO Journal of Power Sources (1997), 68(1), 102-105
CODEN: JPSODZ; ISSN: 0378-7753
PB Elsevier
DT Journal
LA English
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
AB The authors developed high-capacity lithium-ion cells using graphitized **mesophase-pitch**-based carbon fiber (MCF) as an anode material. The graphitized MCF is a highly graphitized carbon fiber with a radial-like texture in the cross

section. This structure contributes to the rapid diffusion of lithium ions inside the carbon fiber. The diffusion coeff. of lithium ions in the graphitized MCF was one order of magnitude larger than that for **graphite**, resulting in an excellent high-rate performance of the carbon **electrode**. The graphitized MCF anode showed larger capacity, higher rate capability, and better reversibility than the **graphite** anode. Prismatic cell (8.6 mm + 34 mm + 48 mm) with the graphitized MCF anode exhibited a large capacity of >1000 mA-h. At 3 A discharge, the prismatic cell had 95% of its capacity at 0.5 A discharge with a mid-discharge voltage of 3.35 V. The cell maintained >85% of its initial capacity after 500 cycles and showed high capacity at -20°. It has thus been demonstrated that the prismatic cell using the graphitized MCF anode has excellent performance, and is an attractive choice for the power sources of cellular phones and other appliances.

ST lithium ion battery development; carbon fiber graphitized anode lithium battery

IT Battery anodes
Secondary batteries
(development and performance of high-capacity lithium-ion batteries with graphitized mesophase-pitch-based carbon fiber anodes)

IT Carbon fibers, uses
Carbon fibers, uses
RL: DEV (Device component use); USES (Uses)
(graphite, pitch-based; development and performance of high-capacity lithium-ion batteries with graphitized mesophase-pitch-based carbon fiber anodes)

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Fong, R; J Electrochem Soc 1990, V137, P2009 HCAPLUS
(2) Imanishi, N; J Electrochem Soc 1993, V140, P315 HCAPLUS
(3) Inada, K; Proc Primary and Secondary Ambient Temperature Lithium Batteries 1988, V88-6, P530 HCAPLUS
(4) Mohri, M; J Power Sources 1989, V26, P545 HCAPLUS
(5) Sato, M; Primary and Secondary Lithium Batteries 1991, V91-3, P407 HCAPLUS
(6) Takami, N; J Electrochem Soc 1995, V142, P2564 HCAPLUS
(7) Takami, N; J Electrochem Soc 1995, V142, P371 HCAPLUS
(8) Yazami, R; J Power Sources 1983, V9, P365 HCAPLUS

L35 ANSWER 31 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 3
AN 1995:503423 HCAPLUS
DN 122:244195
ED Entered STN: 22 Apr 1995
TI Nonaqueous electrolyte secondary lithium batteries
IN Sugimoto, Toyoji; Ozaki, Yoshuki; Ootsuka, Atsushi; Takai, Tooru
PA Matsushita Electric Ind Co Ltd, Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M010-40
ICS H01M004-02
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 07037618	A2	19950207	JP 1993-181141	

199307
22

PRAI JP 1993-181141 19930722

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 07037618	ICM	H01M010-40
	ICS	H01M004-02
	IPCI	H01M0010-40 [ICM,6]; H01M0004-02 [ICS,6]

AB The batteries comprise Li-contg. mixed oxide **cathodes**, nonaq. electrolytes, rechargeable **cathodes** of composite carbon materials consisting of **spherical graphite** particles having optically anisotropic single phase, and other **graphite** fine particles having an av. diam. smaller than that of another **graphite** particles. The **spherical graphite** particles may be manufd. by graphitization of mesocarbon microbeads from **mesophase** small spheres formed at carbonization of **pitch**, have lamella structures, and lattice distance (d002) 3.36-3.39 Å. The composite carbon materials may contain ≤20%, preferably 3-15%, the **graphite** fine particles to the **spherical graphite** particles. The **graphite** fine particles may be natural or **synthetic graphite** from petroleum or coal **pitch.**

ST graphite lithium battery anode

IT Anodes
(battery, anodes contg. different graphite particles for secondary Li batteries for cycle performance)

IT Pitch
(coal-tar, graphite from; anodes contg. different graphite particles for secondary Li batteries for cycle performance)

IT Pitch
(petroleum, graphite from; anodes contg. different graphite particles for secondary Li batteries for cycle performance)

IT 7782-42-5, Graphite, uses
RL: DEV (Device component use); USES (Uses)
(anodes contg. different graphite particles for secondary Li batteries for cycle performance)

IT 7440-44-0, Mesocarbon microbeads, uses
RL: DEV (Device component use); USES (Uses)
(graphitized; anodes contg. different graphite particles for secondary Li batteries for cycle performance)

L35 ANSWER 32 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1995:709126 HCAPLUS
DN 123:88518
ED Entered STN: 29 Jul 1995
TI Secondary nonaqueous electrolyte batteries having improved anodes
IN Ootsuka, Atsushi; Sugimoto, Toyoji; Ozaki, Yoshuki; Takai, Tooru
PA Matsushita Electric Ind Co Ltd, Japan
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-02
ICS H01M004-58; H01M010-40
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

PI JP 07134988 A2 19950523 JP 1993-281159
199311
10
JP 3048808 B2 20000605
PRAI JP 1993-281159 19931110
CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 07134988	ICM	H01M004-02
	ICS	H01M004-58; H01M010-40
	IPCI	H01M0004-02 [ICM,6]; H01M0004-58 [ICS,6]; H01M0010-40 [ICS,6]

AB In the batteries having Li-contg. oxides as **cathode** active mass, powd. **graphite**-based rechargeable anodes, and nonaq. electrolytes, the **graphite** powders as Li-intercalatable and optically anisotropic spheres are obtained by graphitizing **mesophase** small spheres formed in low-temp. heating of **pitches** and have monophase lamellar structure, 002 plane lattice spacing (d002) by wide-angle x-ray diffraction 3.36-3.40 Å, and sp. surface area by BET method 0.7-5.0 m2/g. The batteries have high capacity, energy d., and storage property.
ST battery anode graphite powder
IT Anodes
(battery, nonaq. electrolyte batteries using anodes of Li-intercalatable graphite powders having limited structure and surface)
IT 7439-93-2, Lithium, uses
RL: DEV (Device component use); USES (Uses)
(nonaq. electrolyte batteries using anodes of Li-intercalatable graphite powders having limited structure and surface)
IT 7782-42-5, Graphite, uses
RL: DEV (Device component use); USES (Uses)
(powd.; nonaq. electrolyte batteries using anodes of Li-intercalatable graphite powders having limited structure and surface)

L35 ANSWER 33 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1995:899204 HCAPLUS
DN 123:291865
ED Entered STN: 07 Nov 1995
TI Cathode for secondary lithium batteries and its manufacture
IN Takami, Norio; Ohsaki, Takahisa; Tamaki, Toshio; Nakajima, Hideyuki; Katsuta, Yasushi
PA Kabushiki Kaisha Toshiba, Japan; Petroca, Ltd.
SO Eur. Pat. Appl., 17 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H01M004-58
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI EP 675555	A1	19951004	EP 1995-104869	199503 31
EP 675555	B1	19990728		
R: DE, FR, GB				
CN 1113351	A	19951213	CN 1995-103839	199503

				31
CN 1048357	B	20000112		
JP 08069798	A2	19960312	JP 1995-97691	199503 31
JP 3617550	B2	20050209		
US 5795678	A	19980818	US 1995-414195	199503 31
PRAI JP 1994-85246	A	19940401		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 675555	ICM	H01M004-58
	IPCI	H01M0004-58 [ICM,6]
	ECLA	H01M004/58E2
CN 1113351	IPCI	H01M0004-62 [ICM,5]; H01M0004-64 [ICS,5]; H01M0004-38 [ICS,5]; H01M0004-04 [ICS,5]
JP 08069798	IPCI	H01M0004-58 [ICM,6]; D01F0009-145 [ICS,6]; H01M0004-02 [ICS,6]; H01M0004-04 [ICS,6]; H01M0010-40 [ICS,6]
US 5795678	IPCI	H01M0004-58 [ICM,6]; H01M0004-02 [ICS,6]
	NCL	429/218.100; 429/209.000
	ECLA	H01M004/58E2

AB The **cathode** comprises milled **graphite** fibers derived from **mesophase pitch** each having circumferential, upper end and lower end faces. Each milled **graphite** fiber is composed of **graphite** layers having voids between them as inlets and outlets for Li ions, and the circumferential, upper end and lower end faces having openings of the voids between the **graphite** layers. This **cathode** can be used to provide a secondary nonaq.-electrolyte battery of large charge and discharge capacities and high charge or discharge c.d.

ST **graphite** fiber milled battery **cathode**; **pitch mesophase** milled **graphite** fiber **cathode**

IT **Cathodes**
(battery, milled **graphite** fibers from **mesophase pitch** for)

IT Carbon fibers, uses
RL: DEV (Device component use); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); USES (Uses)
(graphite, cathodes for secondary lithium batteries)

IT **Pitch**
(**mesophase**, battery **cathodes** from milled **graphite** fibers from)

L35 ANSWER 34 OF 53 JAPIO (C) 2005 JPO on STN
AN 1995-226204 JAPIO
TI MANUFACTURE OF NONAQUEOUS ELECTROLYTE SECONDARY BATTERY
IN OZAKI YOSHIYUKI; KOSHINA HIDE
PA MATSUSHITA ELECTRIC IND CO LTD
PI JP 07226204 A 19950822 Heisei
AI JP 1994-16338 (JP06016338 Heisei) 19940210
PRAI JP 1994-16338 19940210
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1995
IC ICM H01M004-58
ICS H01M004-02; H01M004-04; H01M004-96; H01M010-40
AB PURPOSE: To provide a nonaqueous electrolyte secondary battery with high capacity recovery capability and high charge/discharge cycle

performance by preventing the deposition of metallic lithium on the surface of an **electrode** by use of a negative **electrode** made mainly of **mesophase graphite.**
CONSTITUTION: **Mesophase** spherules are produced by heat melting treatment of coal **pitch.** The **mesophase** spherules are crushed, carbonized, and graphitized to produce **mesophase graphite.** Paste mainly comprising the **mesophase graphite** is applied to both surfaces of a foil core material of **copper** and the like and they are press molded to form a negative **electrode.** The negative **electrode** and a positive **electrode** are spirally wound through a separator to form an **electrode** group 4. From the **electrode** group 4, a positive lead 5 is connected to a sealing plate 2, and a negative lead 6 to the bottom of a battery case 1, The upper and lower parts of the **electrode** group 4 are covered with an insulating ring 7 respectively. They are housed in the battery case 1, and the battery case 1 is sealed with the sealing plate 2 through an insulating gasket 3. A secondary battery having high capacity, high energy density, and high charging performance at low temperature is provided.
COPYRIGHT: (C)1995,JPO

L35 ANSWER 35 OF 53 JAPIO (C) 2005 JPO on STN
AN 1995-153486 JAPIO
TI LITHIUM SECONDARY BATTERY
IN TSUKAMOTO HISASHI
PA JAPAN STORAGE BATTERY CO LTD
PI JP 07153486 A 19950616 Heisei
AI JP 1993-326273 (JP05326273 Heisei) 19931130
PRAI JP 1993-326273 19931130
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1995
IC ICM H01M010-36
ICS H01M010-40
AB PURPOSE: To improve the high-rate discharge characteristic at a low temperature by using a lithium secondary battery added with gamma butyrolactone of a specific range % (volume &) to a mixture of ethylene carbonate and dimethyl carbonate at the specific volume ratio.
CONSTITUTION: The dielectric constant of an electrolyte added and mixed with gamma butyrolactone to a mixture of ethylene carbonate (EC) and dimethyl carbonate (DMC) at the volume ratio of 1:1 at -20°C is higher than that of the conventional mixture of EC+DMC+DEC (2:2:1). LiCoO<SB>2</SB> having the average grain size of 6μm, acetylene black powder, and polyvinylidene fluoride are mixed, N-methyl pyrrolidone is added into a paste shape, and it is coated with an Al foil to form a positive **electrode** plate, for example. **Artificial graphite** and **spherical graphite** are mixed, polyvinylidene is mixed, N-methyl pyrrolidone is added, and it is applied to a copper foil to form a negative **electrode** plate. Both **electrode** plates are stored in a container, and the electrolyte is injected to obtain a battery having a high-rate discharge characteristic at a low temperature.
COPYRIGHT: (C)1995,JPO

L35 ANSWER 36 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1995:539256 HCAPLUS
DN 122:295263
ED Entered STN: 10 May 1995
TI Battery characteristics with various carbonaceous materials

AU Kuribayashi, Isao; Yokoyama, Mika; Yamashita, Masataka
CS A and T Battery Corporation, Imperial Tower 17F, 1-1 Uchisaiwai-cho, 1-chome, Chiyoda-ku, Tokyo, 100, Japan
SO Journal of Power Sources (1995), 54(1), 1-5
CODEN: JPSODZ; ISSN: 0378-7753
PB Elsevier
DT Journal
LA English
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
AB Various carbonaceous particles having a core-shell structure, produced from **graphite** and pseudo-**graphite** coated with **pitch**-blended phenol resin and green **mesophase-pitch** coated with phenol resin and ground **graphite** powder, were investigated as active materials for neg. **electrodes.** The particles with natural **graphite** cores, as well as those with pseudo-**graphite** cores, were stable both in 1M LiClO4-PC (propylene carbonate):EC (ethylene carbonate) (50:50) electrolyte and in 1.5M LiBF4-PC:EC:BL (γ-butyrolactone) (25:25:50) electrolyte, and showed excellent elec. capacities. Those produced from green **mesophase-pitch** cores were of markedly deformed configuration and showed large capacity gains with only small addns. of **graphite** powder to the phenol coating material. Neg. **electrodes**, in which the particles contg. natural **graphites** cores were blended with petroleum coke in various ratios, showed that it may be possible to produce cells with specific discharge voltage curves, by varying the ratio of this blend.
ST carbonaceous material anode battery
IT Carbonaceous materials
RL: DEV (Device component use); USES (Uses)
(battery characteristics with various carbonaceous materials)
IT Phenolic resins, uses
RL: DEV (Device component use); USES (Uses)
(carbonaceous particles coated with pitch-blended; battery characteristics with various carbonaceous materials)
IT Anodes
(battery, battery characteristics with various carbonaceous materials)
IT Coke
RL: DEV (Device component use); USES (Uses)
(petroleum, battery characteristics with various carbonaceous materials)
IT 7782-42-5, Graphite, uses
RL: DEV (Device component use); USES (Uses)
(natural and artificial; battery characteristics with various carbonaceous materials)

L35 ANSWER 37 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1995:232637 HCAPLUS
DN 122:35101
ED Entered STN: 08 Dec 1994
TI Carbon fibers and natural graphite as negative electrodes for lithium ion-type batteries
AU Yazami, R.; Zaghib, K.; Deschamps, M.
CS Laboratoire d'Ionique et d'Electrochimie du Solide de Grenoble (URA CNRS 1213), ENSEEG, BP 75, Saint-Martin-dHeres, 38402, Fr.
SO Journal of Power Sources (1994), 52(1), 55-60
CODEN: JPSODZ; ISSN: 0378-7753
PB Elsevier
DT Journal

LA English
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72
AB Carbon fibers (CFs), from different origins, and natural graphite are used as host lattices for lithium electrochem. intercalation and de-intercalation in org. liq. and solid polymer electrolytes, resp. In both systems, irreversible behavior occurred during the first cycle of which the origin is tentatively discussed. The reversible capacity of the mesophase CFs-based electrodes, which is related to the total relative amt. of lithium exchanged with the electrolyte during the charge/discharge operations, is found to increase with their crystallinity. Some thermodn. data assocd. with the formation of the stage-1 graphite-lithium compd. in polymer electrolyte-based cells are detd.
ST lithium battery anode carbon fiber graphite
IT Carbon fibers, uses
RL: DEV (Device component use); USES (Uses)
(carbon fibers and natural graphite as neg. electrodes for lithium ion-type batteries)
IT Pitch
(isotropic, precursor for carbon fibers; carbon fibers and natural graphite as neg. electrodes for lithium ion-type batteries)
IT Batteries, secondary
(lithium/PEO-lithium perchlorate/graphite lithium and lithium/propylene carbonate-ethylene carbonate-dimethoxyethane-lithium tetrafluoroborate/carbon fibers)
IT Anodes
(battery, carbon fibers and natural graphite as neg. electrodes for lithium ion-type batteries)
IT **Pitch**
(**mesophase**, precursor for carbon fibers; carbon fibers and natural **graphite** as neg. **electrodes** for lithium ion-type batteries)
IT 12192-58-4 39448-96-9, Graphite lithium
RL: DEV (Device component use); USES (Uses)
(carbon fibers and natural graphite as neg. electrodes for lithium ion-type batteries)
IT 7782-42-5, Graphite, uses
RL: DEV (Device component use); USES (Uses)
(natural and pyrolytic; carbon fibers and natural graphite as neg. electrodes for lithium ion-type batteries)
IT 25014-41-9, Polyacrylonitrile
RL: NUU (Other use, unclassified); USES (Uses)
(precursor for carbon fibers; carbon fibers and natural graphite as neg. electrodes for lithium ion-type batteries)

L35 ANSWER 38 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1994:58595 HCAPLUS
DN 120:58595
ED Entered STN: 05 Feb 1994
TI Secondary nonaqueous batteries and manufacture of anodes for the batteries
IN Ito, Zenichiro; Ozaki, Yoshuki; Morita, Teruyoshi; Yamaura, Junichi
PA Matsushita Electric Ind Co Ltd, Japan
SO Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-04
ICS H01M004-02; H01M004-58

CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 05290833	A2	19931105	JP 1992-90534	19920410
JP 3191394	B2	20010723		
US 5344724	A	19940906	US 1993-42794	19930406
PRAI JP 1992-90534	A	19920410		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 05290833	ICM	H01M004-04
	ICS	H01M004-02; H01M004-58
	IPCI	H01M0004-04 [ICM,5]; H01M0004-02 [ICS,5]; H01M0004-58 [ICS,5]
US 5344724	IPCI	H01M0004-58 [ICM,5]; H01M0006-14 [ICS,5]
	NCL	429/094.000; 429/231.300; 429/231.800
	ECLA	H01M004/58E2; H01M010/40

AB **Mesophase** granules sepd. from the melted **pitch** is carbonized and graphitized at 2500-2900° to form **graphite** granules, mixed with a binder, applied on collectors, and pressed to obtain the title anodes having 25-40% porosity. The batteries use Li-contg. metal oxide-based **cathodes** and **graphite** anodes, where the **graphite** has interplanar spacing d002 3.365-3.390 Å, unit cell length Lc 200-650 Å, and I1360/I1580 = 0.20.apprx.0.40 (I1360 and I1580 are the intensities of peaks at 1360 and 1580/cm, resp., on the Ar laser Reman spectrum of the **graphite**).

ST lithium battery graphite anode

IT Carbonaceous materials
RL: USES (Uses)
(graphitized, specifications and manuf. of, for lithium battery anodes)

IT Anodes
(battery, lithium, graphitized carbonaceous materials for, specifications and prepn. of)

IT 7782-42-5, Graphite, uses
RL: DEV (Device component use); USES (Uses)
(for anodes, specifications and manuf. of, for lithium batteries)

L35 ANSWER 39 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1993:630107 HCAPLUS
DN 119:230107
ED Entered STN: 27 Nov 1993
TI Secondary organic-electrolyte batteries
IN Yasunami, Shoichiro; Kagawa, Okimasa; Maekawa, Yukio
PA Fuji Photo Film Co Ltd, Japan
SO Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-58
ICS H01M004-02; H01M010-40
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 05174820	A2	19930713	JP 1991-338959	199112 20
	JP 3239302	B2	20011217		
PRAI	JP 1991-338959		19911220		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 05174820	ICM	H01M004-58
	ICS	H01M004-02; H01M010-40
	IPCI	H01M0004-58 [ICM,5]; H01M0004-02 [ICS,5]; H01M0010-40 [ICS,5]
	ECLA	H01M004/48B2; H01M004/52B2; H01M004/58E; H01M004/58E2

AB The batteries have Li-contg. transition metal chalcogenide **cathodes** and carbonaceous anodes, where the anodes are composed of fine low-graphitization C powder having unit cell length Lc 8-150Å, interplanar spacing d002 3.42-3.65Å, real d. 1.60-2.20 g/cm3 and/or fine carbon fibers. The C powder may be carbonized polyacrylonitrile, coal-based coke, **mesophase pitch**, or carbon black; and the carbon fibers may be fibrous **graphite**. The chalcogenide may be LiaCobVcOd (a=0.1-1.1, b=0.15-0.9, c=1-b, d=2-2.5) or LiaCobNicOd.

ST lithium battery carbonaceous anode; transition metal lithium oxide cathode

IT Carbon black, uses
Coke
RL: USES (Uses)
(anodes contg., lithium-intercalating, for batteries)

IT Batteries, secondary
(lithium-intercalating carbon/lithium transition metal chalcogenide)

IT Carbon fibers, uses
RL: USES (Uses)
(graphite, anodes contg., lithium-intercalating, for batteries)

IT Pitch
(mesophase, anodes contg., lithium-intercalating, for batteries)

IT 9003-54-7D, pyrolyzed 25014-41-9D, Polyacrylonitrile, pyrolyzed
RL: USES (Uses)
(anodes contg., lithium-intercalating, for batteries)

IT 7439-93-2, Lithium, uses
RL: USES (Uses)
(anodes from carbonaceous materials intercalated with, for batteries)

IT 7440-44-0 7782-42-5
RL: USES (Uses)
(carbon fibers, graphite, anodes contg., lithium-intercalating, for batteries)

IT 147521-85-5, Cobalt lithium vanadium oxide (Co0.5Li0.5V0.5O2.5)
151028-39-6, Cobalt lithium nickel oxide (Co0.5Li0.5Ni0.5O2.5)
RL: DEV (Device component use); USES (Uses)
(cathodes, for batteries)

L35 ANSWER 40 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1994:139205 HCAPLUS
DN 120:139205
ED Entered STN: 19 Mar 1994
TI Lithium secondary battery and method of manufacturing carbonaceous anode materials

IN Takami, Norio; Satoh, Asako; Ohsaki, Takahisa
PA Toshiba Corp., Japan
SO Eur. Pat. Appl., 52 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H01M004-58
ICS H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 573266	A1	19931208	EP 1993-304258	19930601
	EP 573266	B1	19991208		
	R: DE, FR, GB				
	JP 06168725	A2	19940614	JP 1993-56194	19930316
	JP 3241850	B2	20011225		
	JP 06275321	A2	19940930	JP 1993-58565	19930318
	JP 3162531	B2	20010508		
	US 5340670	A	19940823	US 1993-69424	19930601
	KR 134638	B1	19980515	KR 1993-9983	19930601
PRAI	JP 1992-140247	A	19920601		
	JP 1992-261418	A	19920930		
	JP 1993-56194	A	19930316		
	JP 1993-58565	A	19930318		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 573266	ICM	H01M004-58
	ICS	H01M010-40
	IPCI	H01M0004-58 [ICM,5]; H01M0010-40 [ICS,5]
	ECLA	H01M004/58E2; H01M010/40
JP 06168725	IPCI	H01M0004-58 [ICM,5]; H01M0004-02 [ICS,5]; H01M0010-40 [ICS,5]
JP 06275321	IPCI	H01M0010-40 [ICM,5]; H01M0004-02 [ICS,5]; H01M0004-58 [ICS,5]
US 5340670	IPCI	H01M0010-40 [ICM,5]
	NCL	429/331.000; 423/445.000R; 423/448.000; 429/231.500; 429/231.800; 429/330.000; 429/332.000
KR 134638	IPCI	H01M0004-02 [ICM,6]

AB The lithium secondary battery includes a **cathode** housed in a case, an anode housed in the case and contg. a carbonaceous material with exothermic peak at ≥700° when measured by a differential thermal anal. and an intensity ratio P101/P100 of a (101) diffraction peak P101 to a (100) diffraction peak P100 of a **graphite** structure, obtained by x-ray diffraction anal., of 0.7 to 2.2, and absorbs lithium ions, a separator housed in the case so as to be arranged between the pos. and neg. **electrodes**, and a nonaq. electrolyte contained in the case. The battery has high capacity and excellent charge-discharge efficiency, cycle life,

flatness of a discharge voltage, and rapid charge-discharge cycle characteristics.

ST lithium battery carbon anode

IT Rubber, butadiene-styrene, uses
RL: PREP (Preparation)
(in carbon anode prepn. for nonaq. secondary lithium batteries)

IT Carbon black, uses
RL: USES (Uses)
(in nonaq. secondary lithium batteries with carbon anode)

IT Batteries, secondary
(lithium, nonaq., with carbon anode)

IT **Pitch**
(**mesophase**, in carbon anode prepn. for nonaq. secondary lithium batteries)

IT 9004-32-4, Cmc
RL: USES (Uses)
(in carbon anode prepn. for nonaq. secondary lithium batteries)

IT 75-05-8, Acetonitrile, uses 75-52-5, Nitromethane, uses 79-20-9, Methyl acetate 96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate 98-95-3, Nitrobenzene, uses 105-58-8, Diethyl carbonate 107-21-1, Ethylene glycol, uses 108-32-7, Propylene carbonate 108-88-3, Toluene, uses 141-78-6, Ethyl acetate, uses 616-38-6, Dimethyl carbonate 1330-20-7, Xylene, uses 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses **7440-50-8**, **Copper**, uses 7782-50-5, Chlorine, uses 7791-03-9, Lithium perchlorate 9002-84-0, Ptfe 9010-79-1, Ethylene-propylene copolymer 12597-68-1, Stainless steel, occurrence 14283-07-9, Lithium borofluoride 21324-40-3 29935-35-1 33454-82-9 39300-70-4, Lithium nickel oxide 39457-42-6, Lithium manganese oxide 52627-24-4, Lithium cobalt oxide 90076-65-6, Lithium bistrifluoromethylsulfonylimide
RL: USES (Uses)
(in nonaq. secondary lithium batteries with carbon anode)

IT 9003-55-8
RL: USES (Uses)
(rubber, in carbon anode prepn. for nonaq. secondary lithium batteries)

L35 ANSWER 41 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1993:201212 HCAPLUS
DN 118:201212
ED Entered STN: 14 May 1993
TI Manufacture of artificial graphite electrodes for electrolytic steel manufacture
IN Kanbe, Masazumi; Noda, Tomoyoshi; Miwa, Shigeru
PA Nippon Steel Chemical Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C25C007-02
ICS C01B031-04; C04B035-54
CC 72-2 (**Electrochemistry**)
Section cross-reference(s): 55

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 04285189	A2	19921009	JP 1991-70316	19910312
PRAI JP 1991-70316		19910312		

CLASS PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 04285189	ICM	C25C007-02
	ICS	C01B031-04; C04B035-54
	IPCI	C25C0007-02 [ICM,5]; C01B0031-04 [ICS,5]; C04B0035-54 [ICS,5]

AB In the manuf. of artificial **graphite electrodes** using needle coke and binder **pitch** as starting materials, β resin conc. is added when needle coke and binder **pitch** are kneaded and heated or before the kneading and heating it is added to binder **pitch** and/or needle coke, thereby the content of β resin in the entire blend is adjusted to 6-10 wt.%. The β resin conc. is obtained from the extn. of coal tar or coal tar **pitches** by arom. hydrocarbon solvents and contains ash ≤0-1 wt.% and quinoline-sol. but toluene-insol matter ≥50 wt.% followed by pulverization. The content of β resin is a kneaded mixt. of starting materials can be adjusted easily and it is unnecessary to carry out excessive thermal modification which can bring about softening point rising or formation of **mesophase** by the increase of β resin in binder **pitch** so that workability becomes better and artificial **graphite electrodes** having improved properties can be obtained just by adjusting the amt. of β resin conc. to be added.

ST graphite electrode beta resin adjustment; coke needle binder pitch graphite electrode; steel electrochem prepn graphite electrode

IT Electrodes
(graphite, artificial, prepn. of, from needle coke and binder pitch for steel making)

IT Polymers, uses
RL: USES (Uses)
(β-, in artificial graphite electrodes manuf., phys. properties of electrodes in relation to)

IT 7782-42-5P, Graphite, uses
RL: PREP (Preparation)
(electrodes, artificial, prepn. of, from needle coke and binder pitch)

IT 12597-69-2P, Steel, preparation
RL: PREP (Preparation)
(manuf. of, electrolytic, artificial graphite electrode for)

L35 ANSWER 42 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1991:252629 HCAPLUS
DN 114:252629
ED Entered STN: 28 Jun 1991
TI Manufacture of graphite **electrode** nipples
IN Griffin, Robert R.; Roussel, Keith M.; Fu, Ta Wei
PA Conoco, Inc., USA
SO U.S., 5 pp. cont.-in-part of U.S. Ser. No. 210,689, abandoned.
CODEN: USXXAM
DT Patent
LA English
IC ICM C01B031-00
INCL 264029500
CC **57-8** (Ceramics)
Section cross-reference(s): 55

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 4998709	A	19910312	US 1990-513468	

199004
19

JP 04230994 A2 19920819 JP 1991-59588

199102
28

JP 3351540 B2 20021125
PRAI US 1988-210689 B2 19880623
US 1990-513468 A 19900419

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 4998709	ICM	C01B031-00
	INCL	264029500
	IPCI	C01B0031-00 [ICM,5]
	NCL	264/029.500; 029/825.000; 264/029.700; 264/105.000; 264/108.000; 373/092.000; 403/DIG.005; 428/408.000
JP 04230994	IPCI	H05B0007-14 [ICM,5]; C25B0009-02 [ICA,5]

AB **Graphite** nipples suitable for connecting **graphite electrodes** used in steelmaking are prepd. by adding 8-20 wt.% C fibers produced from spun **mesophase pitch** to 45-65 wt.% premium coke and 22-28 wt.% binder to form an extrusion blend, extruding the extrusion blend to form an elongated C nipple, and subjecting the C nipple to 760-982° for 2-5 wk then to .gtorsim.2704° for 5-14 days. The graphitized C fibers of the **graphite** nipples have tensile strength (200-300) + 103 psi and Young's modulus of elasticity (55-120) + 106 psi.

ST **graphite electrode** joint prepn steelmaking; **mesophase pitch graphite electrode** joint; coke **graphite electrode** joint; carbon fiber **graphite electrode** joint

IT Joints, mechanical
(**electrodes**, **graphite** nipples for, prepn. of, **mesophase pitch**-based carbon fibers in, for high strength)

IT Coke
RL: SPN (Synthetic preparation); PREP (Preparation)
(in **graphite electrode** joint prepn. from **mesophase pitch**-based carbon fibers)

IT **Pitch**
(coal-tar, in **graphite electrode** joint prepn. from **mesophase pitch**-based carbon fibers)

IT Electrodes
(furnace, graphite nipples for, manuf. of, for steelmaking)

IT **Pitch**
(**mesophase**, carbon fibers from, manuf. of, in **graphite electrode** joint prepn.)

IT Carbon fibers, uses and miscellaneous
RL: SPN (Synthetic preparation); PREP (Preparation)
(**pitch**-based, **mesophase**, in **graphite electrode** joint prepn.)

IT 7440-44-0 **7782-42-5**
RL: USES (Uses)
(carbon fibers, **pitch**-based, **mesophase**, in **graphite electrode** joint prepn.)

IT 1332-37-2, Iron oxide, uses and miscellaneous
RL: USES (Uses)
(in **graphite electrode** joint prepn. from **mesophase pitch**-based carbon fibers)

L35 ANSWER 43 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1990:636597 HCAPLUS
DN 113:236597
ED Entered STN: 22 Dec 1990
TI Manufacture of graphite products with high density and strength, and graphite **electrodes** for electric-discharge machining
IN Fukuda, Noriyoshi; Hagiwara, Kiyoshi; Torii, Takayuki; Nagayama, Katsuhiro
PA Kawasaki Steel Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C04B035-54
ICS B23H001-08; C10C003-00
CC **57-8** (Ceramics)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 02088464	A2	19900328	JP 1988-163626	198806 30
PRAI JP 1988-33750	A1	19880216		
JP 1988-136590	A1	19880602		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 02088464	ICM	C04B035-54
	ICS	B23H001-08; C10C003-00
	IPCI	C04B0035-54 [ICM,5]; B23H0001-08 [ICS,5]; C10C0003-00 [ICS,5]

AB The title **graphite** products (or **electrodes**) are manufd. by mixing **mesophase** C beads with ≤40 wt.% mixt. contg. 100 wt. parts **graphite** and/or coke and 30-120 wt. parts **pitch** contg. from 40 to <95 wt.% C6H6 insols., molding, firing, and graphitizing.

ST **mesophase** carbon **pitch** coke **graphite** product; **electrode graphite** elec discharge machining

IT Pitch
(graphite products from mesophase carbon and coke and, with high d. and strength)

IT Coke
RL: USES (Uses)
(graphite products from mesophase carbon and pitch and, with high d. and strength)

IT Electrodes
(graphite, manuf. of, for elec.-discharge machining)

IT Machining
(elec.-discharge, **graphite electrodes** for, manuf. of high-d. and -strength, from **mesophase** carbon and coke and **pitch**)

IT 7440-44-0, Carbon, uses and miscellaneous
RL: USES (Uses)
(mesophase, graphite products from coke and pitch and, with high d. and strength)

IT 7782-42-5, Graphite, uses and miscellaneous
RL: USES (Uses)
(products, with high d. and strength, from mesophase carbon and coke and pitch)

L35 ANSWER 44 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1989:234523 HCAPLUS
DN 110:234523
ED Entered STN: 25 Jun 1989
TI **Mesophase pitch** for **graphite electrode** production
IN Matsubara, Kenji; Okuyama, Yasuo; Ueno, Ichiro
PA Nippon Kokan K. K., Japan
SO Jpn. Kokai Tokkyo Koho, 3 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C10C003-04
ICS C10C003-10
ICA C04B041-82; C10C003-02
CC **51-19** (Fossil Fuels, Derivatives, and Related Products)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 63278995	A2	19881116	JP 1987-114009	198705 11
JP 04038790	B4	19920625		

PRAI JP 1987-114009 19870511
CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 63278995	ICM	C10C003-04
	ICS	C10C003-10
	ICA	C04B041-82; C10C003-02
	IPCI	C10C0003-04 [ICM,4]; C10C0003-10 [ICS,4]; C04B0041-82 [ICA,4]; C10C0003-02 [ICA,4]

AB The title pitch is manufd. by hydrogenating petroleum pitch or coal-tar pitch, mixing 5-40% light oil with the hydrogenated pitch and heating the mixt. under inert atm. environment to obtain a mesophase pitch product. The light oil has an av. mol. wt. of 100-500 and contains mainly 2-6-ring arom. components. Thus, a coal-tar pitch was catalytically hydrogenated, mixed with 25% light oil (b. 540°), and heated at 400° under N for .apprx.2 h to obtain a mesophase pitch with viscosity 0.25 P.
ST **pitch mesophase graphite electrode** prodn; coal tar **pitch** hydrogenation **mesophase**
IT **Electrodes**
(**graphite**, prodn. of, **mesophase pitch** for)
IT **Pitch**
(**mesophase**, manuf. of, from coal-tar **pitch**, for **graphite electrode** prodn.)

L35 ANSWER 45 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1989:176541 HCAPLUS
DN 110:176541
ED Entered STN: 12 May 1989
TI Coal-tar pitch for graphite **electrode** production
IN Sato, Maki; Matsui, Yoshiaki; Yamada, Masahiro; Fujimoto, Kenichi
PA Nippon Steel Corp., Japan; Nippon Steel Chemical Co., Ltd.
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C10C003-04

ICS C01B031-00; C10C003-10
CC **51-19** (Fossil Fuels, Derivatives, and Related Products)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 63256690	A2	19881024	JP 1987-90673	198704 15
JP 06072224	B4	19940914		
PRAI JP 1987-90673		19870415		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 63256690	ICM	C10C003-04
	ICS	C01B031-00; C10C003-10
	IPCI	C10C0003-04 [ICM,4]; C01B0031-00 [ICS,4]; C10C0003-10 [ICS,4]

AB The title pitch is prepd. by (a) contacting the coal-tar pitch with a hydrogenation catalyst at 300-500° to obtain a hydrogenated pitch having an H absorption amt. 5 g/kg pitch feed and the denitrogenation efficiency ≤80 wt.%; and (b) heat-soaking the hydrogenated pitch at 350-450° under N for 0.5-10 h, preferably 4-6 h to obtain a mesophase pitch product. Thus, a coal-tar pitch (softening point 31.6°, contg. MePh-insols. 6.8, quinoline-insols. trace, fixed C 31.8, and N 1.46 wt.%) was contacted with a Ni-Mo/Al2O3 catalyst at 398°, 150 kg/cm2 and 1.98 h-1 liq. space velocity to obtain a soft hydrogenated pitch, which was then heated under N in an autoclave at 380° for 5 h to obtain a mesophase pitch having softening point 90.6°, contg. MePh-insols. 29.6, quinoline-insols. 9.8 and fixed C 57.1 wt.%.

ST coal tar **pitch mesophase** manuf; **graphite electrode mesophase pitch** hydrogenation; nickel molybdenum catalyst **pitch** hydrogenation

IT **Pitch**
(**mesophase**, manuf. of, from coal-tar **pitch**, by hydrogenation and heat-soaking, for **graphite electrode** prodn.)

IT 7439-98-7, Molybdenum, uses and miscellaneous 7440-02-0, Nickel, uses and miscellaneous
RL: CAT (Catalyst use); USES (Uses)
(catalyst contg., in hydrogenation of coal-tar pitch)

L35 ANSWER 46 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1989:176540 HCAPLUS
DN 110:176540
ED Entered STN: 12 May 1989
TI Coal-tar pitch for graphite **electrode** production
IN Matsui, Yoshiaki; Sato, Maki; Yamada, Masahiro; Fujimoto, Kenichi
PA Nippon Steel Corp., Japan; Nippon Steel Chemical Co., Ltd.
SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C10C003-02
ICS C01B031-00; C10C003-10
CC **51-19** (Fossil Fuels, Derivatives, and Related Products)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

PI JP 63256689 A2 19881024 JP 1987-90674 198704 15

JP 06072226 B4 19940914

PRAI JP 1987-90674 19870415

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 63256689	ICM	C10C003-02
	ICS	C01B031-00; C10C003-10
	IPCI	C10C0003-02 [ICM,4]; C01B0031-00 [ICS,4]; C10C0003-10 [ICS,4]

AB The title pitch is manufd. by blending the pitch feed with ≥10 wt.% alcs., heat-soaking the mixt. at ≥250°, and distg. the reaction product to obtain a mesophase pitch with lower softening point. The heat-soaking is preferably carried out at 330-450° for 1-10 h. Thus, 100 wt. parts coal-tar pitch and 45 wt. parts 2-propanol were fed into an autoclave, heated under air, and then N atm. at 360° and 150 kg/cm2 for 5 h to obtain a mesophase pitch with softening point 89.6° vs. 91.2° for a conventional method.

ST coal tar **pitch mesophase electrode**; propanol **pitch mesophase graphite electrode**

IT **Pitch**
(**mesophase**, manuf. of, from coal-tar **pitch**, by heat-soaking in presence of alcs., for **graphite electrode** prodn.)

IT 67-63-0, 2-Propanol, uses and miscellaneous 107-21-1, Ethylene glycol, uses and miscellaneous 141-43-5, Ethanolamine, uses and miscellaneous
RL: USES (Uses)
(coal-tar **pitch** heat soaking with, in prepn. of **mesophase pitch**, for **graphite electrode** prodn.)

L35 ANSWER 47 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1988:476486 HCAPLUS
DN 109:76486
ED Entered STN: 02 Sep 1988
TI Method for manufacture of carbonaceous feedstock powders used in the production of high-density graphite **electrodes**
IN Wakasa, Tsutomu; Ono, Taku; Yamamoto, Tsuneo; Wakabayashi, Takashi
PA Nippon Denkyoku K. K., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C01B031-02
CC **51-19** (Fossil Fuels, Derivatives, and Related Products)
Section cross-reference(s): 57

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 63089413	A2	19880420	JP 1986-233821	198610 01

PRAI JP 1986-233821 19861001

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES

JP 63089413 ICM C01B031-02
IPCI C01B0031-02 [ICM,4]

AB The title method comprises (a) bubbling molten coal-tar **pitch** with N gas at 300-420° to remove volatile org. components in a 1st reforming stage; (b) heating the reformed **pitch** at 400-450°, and then atomizing through a spray nozzle under N atm. to obtain a reformed **pitch** powder (av. diam. 1-100 μm); (c) contacting the reformed **pitch** powder with hot air in a fluidized bed at 200-300° to form a high m.p. **pitch** powder in a 2nd reforming stage; and (d) heating the high m.p. **pitch** powder under N at 480-550° for 0.5-3 h to obtain **mesophase** **pitch** product useful in the prodn. of high-d. **graphite electrodes.**

ST coal tar **pitch mesophase** manuf; **graphite** **electrode mesophase pitch**

IT **Pitch**
(**mesophase**, manuf. of, from coal-tar **pitch**, for **graphite electrode** prodn.)

IT **7782-42-5P**, uses and miscellaneous
RL: PREP (Preparation)
(**electrodes**, prodn. of, **mesophase** **pitch** prepn. in)

L35 ANSWER 48 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1986:556186 HCAPLUS
DN 105:156186
ED Entered STN: 01 Nov 1986
TI Graphite-base plates
IN Takahashi, Kunimasa; Kameda, Takashi; Shibatani, Haruo
PA Mitsubishi Petrochemical Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C04B035-54
ICS C01B031-04
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 51, 57

FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 61077667	A2	19860421	JP 1984-199737	198409 25
	US 4929404	A	19900529	US 1988-196760	198805 17

PRAI	JP 1984-199737	A	19840925
	JP 1984-255270	A	19841203
	JP 1985-63329	A	19850329
	JP 1985-87264	A	19850423
	US 1985-779590	B1	19850924

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 61077667	ICM	C04B035-54
	ICS	C01B031-04
	IPCI	C04B0035-54 [ICM,4]; C01B0031-04 [ICS,4]
US 4929404	IPCI	C10C0003-00 [ICM,5]; B29C0043-52 [ICS,5]

NCL 264/029.500; 208/044.000; 264/029.100; 264/029.700; 264/101.000; 264/DIG.020

AB The mold-formed plates have elec. resistivity ≤5.0 mΩ-cm and bending strength ≥200 kg/cm2, and they show vol. and wt. change ≤3% when heated at 1000° to be carbonized. Powder materials (max. m.p. 400°, carbonizing yield ≥70% at 1000°) of **graphite** and **pitch** contg. ≤70% quinoline-insol. component and ≥40% **mesophase** are compacted and fired in inert atm. at ≥700°. The dimensionally stable plates are useful as **electrode** substrates and separators of fuel cells. Thus, 630 g tar (b.p. ≥170°, thermal decompn. residue of naphtha) was treated with H at 120 kg/cm2 and 460° in the presence of cracking catalysts (Al2O3-SiO2), filtered, and distd. at ≤490° to give reformed **pitch** in 25%. The **pitch** (10 g) was placed in a reaction vessel, treated with 1,2,3,4-tetrahydroquinoline (I) under an Ar flow for 10 min, immersed in a molten salt bath at 485° while I and Ar were supplied to the liq. **pitch** to give **pitch** (in 52% yield) contg. 100 **mesophase** and 45% quinoline-insol. component. The **mesophase**-contg. **pitch** (1.34 g) was mixed with 8.0 g CPB flake **graphite**, ground, and 1.70 g of the mixt. was packed into a metal mold and precompacted at 1.5 ton/cm2 and 340°. The green compact was held at 1000° under an Ar flow for 30 min to give 1.67 g **graphite**-base plate having bulk d. 2.1 g/mL, vol. shrinkage 0.6%, wt. decrease 1.7% (based on the green compact), elec. resistivity 1.2 mΩ-cm, and bending strength 550 kg/cm2.

ST graphite pitch fuel cell electrode; separator fuel cell graphite pitch; resistance graphite pitch plate

IT Electric resistance
(of graphite plates, for fuel-cell electrodes and separators)

IT Fuel cells
(separators graphite plates for, pitch-bonded stable and high-d.)

IT Electrodes
(fuel-cell, graphite plates for, pitch-bonded stable, and high d.)

IT **Pitch**
(petroleum, **mesophase**, binders, for **graphite** plates, for fuel-cell **electrodes** and separators)

IT **7782-42-5P**, preparation
RL: PREP (Preparation)
(manuf. of plates contg., with **mesophase**-contg. **pitch** binder, for fuel-cell **electrodes** and separators)

L35 ANSWER 49 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1985:426257 HCAPLUS
DN 103:26257
ED Entered STN: 27 Jul 1985
TI Formed carbon as **electrodes**
PA Koa Oil Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C01B031-04
CC **57-8** (Ceramics)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

PI	JP 60016806	A2	19850128	JP 1983-122565	198307 06
	JP 01023405	B4	19890502		
PRAI	JP 1983-122565		19830706		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 60016806	ICM	C01B031-04
	IPCI	C01B0031-04 [ICM,4]

AB To graphitize effectively, a bulk mesophase material (A) (i.e. mesocarbon microbeads prepd. by heating heavy oil at 400-500° and sepg.) is mixed at ≤20% with coal or petroleum pitch as binder (or with acicular coke or their mixt.). Thus, coal-tar pitch (softening temp. 109°, fixed C 56, quinoline-insolsubles 4.2%) was mixed with 3 or 10% A -60 mesh, kneaded with com. needle petroleum coke (8-20, 20-35, and -100 mesh 30, 10, and 60%, resp.) in a 28:100 ratio at 160° for 1 h, extruded at 130°, heated at 200°/h to and at 1000° for 1 h, and then to 2800° to graphitize. The d. was 1.51 or 1.54, Young's modulus 730 or 890, bending strength 100 or 120 kg/mm2, elec. resistivity (+ 10-3 Ω-cm) 0.9 each, thermal expansion coeff. 0.46 or 0.49 + 10-6/degree, and the calcd. thermal shock resistance 920 or 860 cal/cm-s, compared to 1.48, 690, 90, 1.0, 0.45, and 860, resp., with A.

ST carbon mesophase material graphitization electrode

IT Electrodes
(graphite, mesophase microbead additives in manuf. of)

IT Graphitization
(of carbon, mesophase microbead additives in, for electrodes)

IT **Pitch**
(coal-tar, **graphite electrode** manuf. from, **mesophase** microbead additives in)

IT Spheres
(micro-, mesophase carbon, in graphite electrode manuf.)

IT Coke
RL: USES (Uses)
(petroleum, graphite electrode manuf. from, mesophase microbead additives in)

IT 7440-44-0, properties
RL: RCT (Reactant); RACT (Reactant or reagent)
(graphitization of, mesophase microbead additive in, for electrodes)

L35 ANSWER 50 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1979:576486 HCAPLUS
DN 91:176486
ED Entered STN: 12 May 1984
TI Elastomer piezoresistors
IN Kanamori, Katsuhiko
PA Yokohama Rubber Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC C08K007-00; H01B001-04
CC 38-9 (Elastomers, Including Natural Rubber)
Section cross-reference(s): 76

FAN.CNT 2

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

PI	JP 54080350	A2	19790627	JP 1977-148045	197712 12
	JP 56009187	B4	19810227		
	GB 1561189	A	19800213	GB 1977-53596	197712 22
	CA 1096161	A1	19810224	CA 1977-293761	197712 22
	NL 7714355	A	19780627	NL 1977-14355	197712 23
	NL 190556	B	19931116		
	NL 190556	C	19940418		
	DE 2757870	A1	19780629	DE 1977-2757870	197712 23
	DE 2757870	C2	19870813		
	FR 2375698	A1	19780721	FR 1977-39231	197712 26
	FR 2375698	B1	19830429		
	US 4273682	A	19810616	US 1979-83367	197910 10
PRAI	JP 1976-155107	A	19761224		
	JP 1977-148045	A	19771212		
	US 1977-862855	A1	19771212		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 54080350	IC	C08K007-00; H01B001-04
	IPCI	C08K0007-00; H01B0001-04
GB 1561189	IPCI	C08K0007-00
CA 1096161	IPCI	H01B0001-00
NL 7714355	IPCI	C08K0009-00; C08K0003-04; H01C0010-12; H01B0017-64
DE 2757870	IPCI	C08K0007-18
FR 2375698	IPCI	H01C0010-10; B32B0019-02; C08K0003-04; C08K0007-00; C08L0027-06; C08L0083-04
US 4273682	IPCI	H01B0001-06
	NCL	252/511.000; 338/114.000

AB Rubbery polymers contg. powd. **synthetic graphite** having degree of roundness (Wadell) >0.5 are useful as piezoresistors. Thus, a compn. of KE 640-U (silicone rubber) 100, crushed and ground **synthetic graphite** (60-105 μ, degree of roundness 0.72) 70, and peroxide 3.4 parts was rolled and vulcanized to give a 0.5-mm sheet. When the sheet was tested for piezoresistivity between a flat **electrode** and a 3-mm-diam. rod **electrode** (max. pressure 1 kg), there was no noise for >106 cycles, compared with <103 cycles for a similar compn. contg. crushed **synthetic graphite** of degree of roundness 0.25.

ST silicone rubber graphite composite; piezoresistance silicone rubber composite; **roundness** degree **graphite**

IT Rubber, silicone, uses and miscellaneous
RL: USES (Uses)
(piezorsistors, contg. powd. graphite)

IT Piezoresistors
(powd. graphite-contg. rubber)

IT 7782-42-5, uses and miscellaneous
RL: USES (Uses)
(piezoresistors contg., rubber-based)
IT 9002-86-2
RL: USES (Uses)
(piezoresistors, contg. powd. graphite)

L35 ANSWER 51 OF 53 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1976:484759 HCAPLUS
DN 85:84759
ED Entered STN: 12 May 1984
TI Improved graphite articles with low thermal expansion coefficients
IN Singer, Leonard S.; Lewis, Irwin Charles
PA Union Carbide Corp., USA
SO Ger. Offen., 23 pp.
CODEN: GWXXBX
DT Patent
LA German
IC C04B; C25B
CC 72-7 (**Electrochemistry**)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 2542953	A1	19760408	DE 1975-2542953	197509 26
	DE 2542953	B2	19790104		
	DE 2542953	C3	19790830		
	CA 1060161	A1	19790814	CA 1975-234616	197508 29
	AU 7585172	A1	19770331	AU 1975-85172	197509 25
	BE 833903	A1	19760326	BE 1975-160447	197509 26
	DK 7504337	A	19760328	DK 1975-4337	197509 26
	SE 7510818	A	19760329	SE 1975-10818	197509 26
	SE 415094	B	19800908		
	SE 415094	C	19810108		
	NL 7511384	A	19760330	NL 1975-11384	197509 26
	NO 7503281	A	19760330	NO 1975-3281	197509 26
	NO 140716	C	19791024		
	NO 140716	B	19790716		
	FR 2286107	A1	19760423	FR 1975-29677	197509 26
	FR 2286107	B1	19800725		
	JP 51063809	A2	19760602	JP 1975-116292	197509 26
	JP 54026235	B4	19790903		

ZA 7506130	A	19760929	ZA 1975-6130	197509 26
ES 441286	A1	19770401	ES 1975-441286	197509 26
CH 605466	A	19780929	CH 1975-12516	197509 26
GB 1526809	A	19781004	GB 1975-39441	197509 26
AT 7507375	A	19830615	AT 1975-7375	197509 26
AT 373566	B	19840210		

PRAI US 1974-510039 A 19740927

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
DE 2542953	IC	C04B; C25B
	IPCI	C04B0035-54; C25B0011-12
CA 1060161	IPCI	C01B0031-00
AU 7585172	IPCI	C09C0001-46
BE 833903	IPCI	C04B
DK 7504337	IPCI	C25B
SE 7510818	IPCI	C01B0031-04
NL 7511384	IPCI	C04B0035-54; C01B0031-04; C25B0011-12
NO 7503281	IPCI	C04B
FR 2286107	IPCI	C01B0031-04; H05B0031-08
JP 51063809	IPCI	C04B0035-64; C01B0031-04
ZA 7506130	IPCI	C10B
ES 441286	IPCI	C10B; B29F
CH 605466	IPCI	C04B0035-54
GB 1526809	IPCI	C01B0031-04
AT 7507375	IPCI	C01B0031-04

AB The title materials are applicable to the fabrication of **electrodes** for high temp. operation. Thus, from a com. petroleum **pitch** was made a **pitch** with a **mesophase** content of 57%, a d. of 1.24 and a softening point of 120°. The chem. anal. was C 93.3, H 5.63, S 1.0 and ash 0.15%. (The quinoline-insol. content was 0.5%.). The **mesophase pitch** was made by heating **pitch** for 15 hr at a temp. of .apprx.400° after which heating the pyridine insol. content was 57%, thus the **pitch** had a **mesophase** content of .apprx.57%. Fibers of 15 μm were spun at 390° in a N atm. and part were heated for 1 hr in an air-atm. furnace to 275° and held at this temp. for an addnl. hr to heat harden. The hardened fibers (.apprx.300g) were cut in 2.54 cm lengths, placed in a Pyrex beaker and in a sagger slowly (60% hr) heated to 500°, held at this temp. for 3 hr and then cooled to room temp. The fibers were then heated to 1000° in a **graphite** crucible and for 5 hr held at this 1000°. The cooled fibers were powdered (.apprx.200 μm) and mixed with coal tar **pitch** (100 parts powder to 80 parts **pitch**) and this mixt. was extruded at a pressure of 7-14 kg/cm2 to a rod 2cm in diam. The rod was heated to 1000° at 60°/hr, held-at this temp. for 2 hr then in .apprx.1 hr heated to 3000° and there held for 2 hr. The rod had a coeff. of thermal expansion of 0.67 + 10-6/°C.

ST graphite electrode thermal expansion

IT Pitch

(graphite electrodes, with low thermal expansion)
IT Electrodes
(graphite, from coal tar pitch, with low thermal expansion)
IT 7782-42-5, uses and miscellaneous
RL: USES (Uses)
(electrodes, from coal tar pitch, with low thermal expansion)

L35 ANSWER 52 OF 53 JAPIO (C) 2005 JPO on STN
AN 2004-127913 JAPIO
TI LITHIUM SECONDARY BATTERY
IN KATO FUMIO; OURA TAKAFUMI; FUKUMOTO YUSUKE; YAMAMOTO NORIHIRO; FUJIWARA SHOZO
PA MATSUSHITA ELECTRIC IND CO LTD
PI JP 2004127913 A 20040422 Heisei
AI JP 2003-160969 (JP2003160969 Heisei) 20030605
PRAI JP 2002-223862 20020731
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2004
IC ICM H01M004-02
ICS H01M002-02; H01M004-58; H01M004-62; H01M004-66; H01M010-40
AB PROBLEM TO BE SOLVED: To improve charge and discharge cycle characteristics of a high energy-density lithium secondary battery, and improve or maintain discharge rate characteristics, low-temperature discharge characteristics, and safety (heat resistance).
SOLUTION: The lithium secondary battery is prepared by using a negative **electrode** wherein active material composed of a mixture consisting of an **artificial graphite** particle A that has been obtained by kneading and granulating the base material made by crushing a bulk **mesophase** **pitch**, a **pitch**, and/or a thermosetting resin in a softened state and by making it carbonized/graphitized, and a sherical **graphite** particle B of which **circularity** is large, is fixed on the **copper** core material. This enables to improve the charge and discharge cycle characteristics of the high energy-density lithium secondary battery, and at the same time to provide the battery that is superior in the discharge rate characteristics, the low-temperature discharge characteristics, and safety (heat resistance).
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L35 ANSWER 53 OF 53 JAPIO (C) 2005 JPO on STN
AN 2000-156226 JAPIO
TI NEGATIVE **ELECTRODE** FOR BATTERY AND NONAQUEOUS ELECTROLYTE SECONDARY BATTERY
IN KOBAYASHI KOTARO; KOJIMA AKIRA
PA SHIN KOBE ELECTRIC MACH CO LTD
PI JP 2000156226 A 20000606 Heisei
AI JP 1998-327923 (JP10327923 Heisei) 19981118
PRAI JP 1998-327923 19981118
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2000
IC ICM H01M004-58
ICS H01M004-02; H01M004-62; H01M010-40
AB PROBLEM TO BE SOLVED: To prevent the delamination and cracking of a mixture layer while keeping high capacity without increasing a quantity of binding agent which inhibits the charging and discharging reaction, in a case when a rolled **copper** foil capable of providing high capacity and the lumped **graphite** powder easily causing the delamination of the mixture layer layer, are used in the negative **electrode** active material.
SOLUTION: In a negative **electrode** for nonaqueous

electrolyte secondary battery comprising a mixture including a carbon material and a polyvinylidene fluoride resin as a binder and a rolled **copper** foil, a mixture of lumped **graphite** powder and **mesophase pitch graphite** fibrous material is used as the carbon material. Whereby the density and adhesion of the mixture can be improved, and the irreversible capacity and the generation of gas at a high temperature can be inhibited.

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